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MACH TABLES FOR REAL GAS EQUILIBRIUM
FLOW OF AIR IN HYPERVELOCITY TEST FACILITIES
WITH TOTAL TEMPERATURES TO 10,000°K

by

K L Goin

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ABSTRACT

Aerodynamic flow parameters for isentropic expansions and flow through normal shocks, including real gas effects, have been calculated for total temperatures of 4000 to 10,000°K and for total pressures of 100 to 4000 atmospheres. Calculations assume equilibrium flow. Results indicate real gas effects vary from a few percent to more than two orders of magnitude.

SUMMARY

Aerodynamic flow parameters for isentropic expansions and flow through normal shocks, including real gas effects, have been calculated for total temperatures of 4000 to 10,000°K and for total pressures of 100 to 4000 atmospheres. Tables are presented in which flow parameters are listed for the throat of a nozzle and for Mach numbers at increments of 0.5 in the range of 2.0 to 30.0. Flow parameters presented include the usual Mach number, velocity, pressure, temperature and density relations plus other parameters useful in the analysis of real gas flows. Combinations of total pressure and temperature are such as to allow duplication of ambient atmospheric conditions at altitudes in the range of 100,000 to 350,000 feet at flow velocities of 10,000 to 24,000 feet per second.

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NOMENCLATURE

c_p	Specific heat at constant pressure, $\text{ft}^2/\text{sec}^2\text{-}^\circ\text{K}$
c_v	Specific heat at constant volume, $\text{ft}^2/\text{sec}^2\text{-}^\circ\text{K}$
R	Universal gas constant, $3089.41 \text{ ft}^2/\text{sec}^2\text{-}^\circ\text{K}$
γ	Ratio of specific heats, c_p/c_v
γ_p	Ratio of specific heats for a perfect fluid
H	Enthalpy, ft^2/sec^2
E	Energy, ft^2/sec^2
T	Temperature, $^\circ\text{K}$
S	Entropy, $\text{ft}^2/\text{sec}^2\text{-}^\circ\text{K}$
q	Dynamic pressure, $\rho U^2/2g$, lb/ft^2
ρ	Density, lb/ft^3
Z	Compressibility factor - mols of air at elevated temperatures per mol of air at reference pressure ($2116.2 \text{ lb}/\text{ft}^2$) and reference temperature (273°K)
a	Speed of sound, ft/sec
U	Velocity, ft/sec
M	Mach number
g	Acceleration of gravity, $32.174 \text{ ft}/\text{sec}^2$

Subscripts

t	Total conditions in stagnation chamber or in isentropic flow upstream of a normal shock
1	Conditions upstream of a normal shock
2	Conditions downstream of a normal shock
t2	Total conditions downstream of a normal shock
o	Conditions at reference pressure and temperature
p	Conditions for calorically and thermally perfect gas with $\gamma = 1.4$. ("Calorically perfect" means the specific heats of the gas are constant and "thermally perfect" means the gas obeys the thermal equation of state, $p = \rho RT/g$.)

Superscript

*	Designates conditions at the throat of a nozzle
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MACH TABLES FOR REAL GAS EQUILIBRIUM FLOW OF AIR IN HYPERVELOCITY
TEST FACILITIES WITH TOTAL TEMPERATURES TO 10,000°K

Introduction

The high flight speeds of today's aircraft result in high air temperatures in the immediate vicinity of the aircraft due to compression through shock waves and energy conversion through viscous effects. In many practical instances, air temperatures become high enough that the vibrational mode of energy is excited, the diatomic molecules dissociate, and the air becomes ionized. These deviations from perfect fluid characteristics result in considerable complication of aerodynamic analyses as compared to the case of low speeds where air temperatures are relatively low and many of the important nondimensional aerodynamic flow parameters are independent of air pressure and temperature.

Practical aerodynamic analyses require a detailed knowledge of flow fields. Since wind tunnels are basic tools for the aerodynamicist and cannot always be operated to provide exact simulation of flight, there is a need for detailed definition of flow parameters in wind tunnels in the range of desirable operating conditions. An early compilation of this type of information was made by the NACA in 1947 (Reference 1). Calculations for these early compilations were based on the assumption that air is a calorically and thermally perfect fluid, as defined under subscript p in the nomenclature.

In 1953 an extension of Reference 1 was published (Reference 2) which included effects of caloric imperfections of air and was thus applicable to higher flight speeds. In the range of air temperatures for which both caloric and thermal imperfections exist, no comprehensive compilation of aerodynamic flow parameters are available. In this range, calculations have been made of normal shock parameters at various altitudes (Reference 3). Also a few of the flow parameters for isentropic expansions in wind-tunnel nozzles have been published in Reference 4.

The purpose of this paper is to present a comprehensive compilation of aerodynamic flow parameters for wind tunnels operating at conditions which might be chosen for practical aerodynamic studies at hypervelocities. Wind-tunnel operating conditions included are total pressures of 100 to 4000 atmospheres and total temperatures of 4000 to 10,000°K. These conditions will allow duplication of ambient atmospheric conditions at altitudes in the range of 100,000 to 350,000 feet at flow velocities of 10,000 to 24,000 feet per second. Calculations include real gas effects and assume the air to be in equilibrium throughout the flow field. An IBM 704 computer was used in making the calculations.

Analysis

Range of Calculations

The range of wind-tunnel operating conditions included in the calculations herein are total pressures of 100 to 4000 atmospheres and total temperatures of 4000 to 10,000°K. The low total temperature limitation was

arbitrarily chosen in order to begin these calculations somewhat above the point where Reference 2 ends. The low pressure and high temperature limitations were selected from consideration of flow freezing of air in the nozzle (failure of the initially dissociated molecules to recombine during expansion to lower temperatures because the rate of cooling is too high). Data of Reference 4 and also results of unpublished work carried out at Sandia Corporation have indicated that flow freezing will become quite significant even before the low pressure limits are reached at temperatures of 6000°K and above. The result of flow freezing is a nonequilibrium mixture of molecules and atoms reaching the test section with severe effects on aerodynamic flow parameters indicated by Reference 4. The high pressure limitation corresponds to the maximum pressure for which high temperature data are available.

One other limit on the range of calculations has been the consideration of 100°K as the minimum-ambient temperature reached during expansions of the flow. This minimum temperature is considerably below the minimum temperature reached in the atmosphere at altitudes below 300,000 feet.

In the above-defined range of total conditions and ambient temperatures, calculations were made of isentropic flow parameters at a nozzle throat and of isentropic and normal shock flow parameters at Mach numbers of 2.0 to 30.0 in increments of 0.5.

Air Properties

A knowledge of air properties through a wide range of conditions is required for determination of the desired aerodynamic flow parameters. Extensive work toward the determination of air properties at high temperatures has been carried out by the National Bureau of Standards and the Cornell Aeronautical Laboratory (References 5-7). It was decided early in this analysis to use high temperature air properties from the latest publication of NBS work (Reference 7) as a basis for calculations.

The data of Reference 7 cover the temperature range of 1500 to 15,000°K. Since air flows of interest herein require a knowledge of air properties at lower temperatures, the next step was to define air properties at temperatures below 1500°K. Two sources were considered for definition of these lower temperature air properties. These were earlier results of NBS work (Reference 8) and equations from NACA work published in Reference 2. It was decided not to use data of Reference 8 because there are some discrepancies between the data therein and the higher temperature data of Reference 7 which would have caused artificial discontinuities in the flow parameters. The NACA work of Reference 2 presents equations for air properties in the desired temperature range which have been used extensively in practical aerodynamic analyses, and it was decided that these would be used in this analysis. Equations used from Reference 2 were those for a thermally perfect-calorically imperfect gas. The equations are as follows:

$$c_p = \frac{\gamma R}{\gamma - 1} \quad (1)$$

$$c_v = \frac{R}{\gamma - 1} \quad (2)$$

$$\gamma = 1 + \frac{\gamma_p - 1}{1 + (\gamma_p - 1) \left[\left(\frac{\theta}{T} \right)^2 \frac{e^{\theta/T}}{(e^{\theta/T} - 1)^2} \right]} \quad (3)$$

$$dH = c_p dT \quad (4)$$

$$dS = c_v \frac{dT}{T} - R \frac{dp}{\rho} \quad (5)$$

Reference 2 defines the constants of the above equations as $\theta = 3056^{\circ}\text{K}$, $R = 3089 \text{ ft}^2/\text{sec}^2 \cdot ^{\circ}\text{K}$ and $\gamma_p = 1.4$.

An examination revealed that the value of the constant R of Reference 2 is quite consistent with that of Reference 7. However, the enthalpies of air presented in Reference 7 at 1500°K are not defined by Equations 3 and 4 when the above values of constants θ and γ_p are used. Consequently, new values of θ and γ_p were calculated which would make Equations 1, 3 and 4 consistent with the data of Reference 7 at 1500°K and also with the normally accepted low temperature value of $\gamma = 1.4$ at 273°K . The new values, $\theta = 2887.42$ and $\gamma_p = 1.40046$, were used in subsequent calculations of air properties at temperatures below 1500°K . A comparison of specific heat ratios obtained using the new constants with values from Reference 2 is presented in Figure 1.

The procedure then used in calculations of air properties was as follows: Equations 1 and 4 were combined to obtain

$$d\left(\frac{H}{R}\right) = \frac{\gamma}{\gamma - 1} dT. \quad (6)$$

Equations 2 and 5 were combined to obtain

$$d\left(\frac{S}{R}\right) = \frac{1}{\gamma - 1} \frac{dT}{T} - \frac{dp}{\rho}. \quad (7)$$

Then, using data of Reference 5 for 1500°K as a reference, numerical integrations of Equations 6 and 7 were performed on the IBM 704 to obtain values of enthalpy and entropy as a function of temperature and density. Value of γ were calculated at temperature increments no greater than 30°K from 80°K to 1500°K and values of $\frac{\gamma}{\gamma - 1}$ and $\frac{1}{\gamma - 1}$ were assumed to vary linearly through each increment of temperature.

Calculation Procedure

A decision was made to use an interpolation procedure within tables of air properties previously described to obtain the desired flow parameters. The Lagrangian interpolation formula of Reference 9 was chosen to be used. This formula accomplishes the interpolation on the basis of a curve passing exactly through a series of data points for which values are known. The degree of the polynomial used for curve fitting is $n - 1$ where n is the number of data points used in the interpolation.

In order to determine the degree of curve to be used in interpolations herein, curves of second to seventh degree were checked for interpolation accuracy at representative locations in the tables of Reference 7. The largest interpolation inconsistencies were found in interpolations of enthalpy versus temperature at low densities and at temperatures in the vicinity of 2000°K . For these conditions the enthalpy interpolation inconsistency decreased from about two-thirds percent with second degree interpolation to one-eighth percent with seventh degree interpolation. The consistency of interpolations for other air properties was considerably better than for enthalpy. It was decided that one-eighth percent consistency would be adequate and that seventh degree interpolation would be used.

To use the IBM 704 computer for required interpolations it is necessary that data in the range of interpolations be available to the machine. Examination revealed that the data storage capacity of the Sandia

Laboratory computer was not adequate for storage of the complete tables of air properties to be used in calculations. It was thus decided to store air properties data on magnetic tape and read it into the machine as required. Data were read into the machine in blocks of eight pages (temperatures) from Reference 7 and from results of previously described low temperature calculations. The program used for the calculations was such that eight data points would always be used for interpolation and where possible four of the data points would lie on each side of the value for which interpolation was required.

Isentropic Expansion

The first step of the program was to make interpolations to determine density, compressibility factor, enthalpy, and entropy at the selected stagnation temperature and pressure. Then, at each temperature below stagnation for which data were available, interpolations were made to determine density, compressibility factor, and enthalpy at the initial value of entropy. Values thus obtained correspond to an isentropic expansion from stagnation conditions to the pertinent temperature.

From the equation for continuity of energy,

$$H_t = H + \frac{1}{2} U^2, \quad (8)$$

together with the total enthalpy and the enthalpy after isentropic expansion to the pertinent temperature, a velocity was calculated. The speed of sound was calculated from the following equations from Reference 7:

$$a = \sqrt{\alpha R T Z} \quad (9)$$

where

$$\alpha = 1 + \frac{1}{Z} \left(\frac{\partial Z}{\partial \ln \rho} \right)_T + \frac{Z \left[1 + \frac{1}{Z} \left(\frac{\partial Z}{\partial \ln T} \right)_\rho \right]^2}{\left(\frac{\partial (E/R)}{\partial T} \right)_\rho} \quad (10)$$

$$E/R = T (H/RT - Z). \quad (11)$$

(Subscript T indicates the partial is evaluated at a specified temperature, and subscript ρ indicates the partial is evaluated at a specified density.)

In Equation 10 the partial derivatives were evaluated by using the interpolation routine to obtain values of Z or E/R at the value of the variable of interest and at one closely spaced interval on either side of this value, then calculating the slope from a second-degree curve passing through these three closely spaced points. From the velocity and speed of sound thus obtained, a Mach number was calculated.

After calculation of the above parameters at each temperature for which air property data were available, the air properties at the throat of a nozzle were calculated as follows. The point at which the velocity density product is maximum during the expansion was specified as the criterion for defining the nozzle throat. The velocity density product was calculated from previously defined flow parameters at the first temperature below stagnation and at each successively lower temperature. This procedure was repeated until the vicinity of the throat was determined. Values of ρU at eight temperatures in the vicinity of the throat were used to interpolate for determining three values of ρU at 10-degree temperature increments in the immediate vicinity of the throat. The temperature at maximum ρU was then obtained by calculating the point of zero slope of a second-degree curve passing through the three points thus obtained. Values of each of the previously defined flow parameters were then used for interpolation to determine the value at the throat temperature. A nozzle area ratio at each

temperature of the isentropic expansion was obtained from the equation for continuity of mass:

$$(\rho UA)^* = \rho UA. \quad (12)$$

Values of the various isentropic flow parameters at the desired Mach number were calculated by interpolation using values previously obtained.

Normal Shock

Normal shock flow parameters were obtained by using the basic equations for continuity of mass, momentum, and energy in conjunction with air properties data. Continuity of energy is defined by Equation 8a and continuity of mass and momentum are defined by Equations 12a and 13.

$$H_t = H_2 + \frac{1}{2} U_2^2 \quad (8a)$$

$$\rho_1 U_1 = \rho_2 U_2 \quad (12a)$$

$$p_1 + \frac{\rho_1 U_1^2}{g} = p_2 + \frac{\rho_2 U_2^2}{g}. \quad (13)$$

In early program checks it was found that the resolution of the enthalpy parameter (H/RT) presented in Reference 7 corresponds to a resolution of approximately 1000 to 3000 ft^2/sec^2 in values of enthalpy. In some cases this resolution can result in significant inaccuracies in determining U_2 and inconsistencies in simultaneous solution of the three continuity equations. In order to reduce the magnitude of inconsistencies, an iteration process was used in conjunction with the usual interpolation routine. In these calculations a value of the density parameter $\log \rho/\rho_0$ to the nearest 10^{-5} was obtained for which the interpolation to obtain H/RT indicated satisfaction of Equations 8a and 12a. At this value of the density parameter the usual interpolation routine was used for calculating other air properties. Also at this point the difference between the pressure defined by the air properties and the pressure defined by continuity of momentum was calculated. This procedure was started at the first temperature below initial total temperature and repeated at successively lower temperatures until the pressure difference changed sign, indicating that the temperature corresponding to simultaneous solution of the three continuity equations had been crossed over.

After thus determining the approximate temperature at which the three continuity equations were satisfied, air properties at conditions satisfying continuity of mass and momentum were obtained by the above described procedure at eight temperatures in the vicinity of the crossover. A similar iterative interpolation routine was then followed to determine the temperature to the nearest 0.1°K which satisfied the continuity of momentum and thus complete solution of the flow through a normal shock. Interpolations were then made to determine the required air properties at this temperature.

The basis for determining total conditions downstream of a normal shock was the specification of a constant entropy compression from the conditions downstream of the shock to zero velocity at the initial total enthalpy. Beginning at the first temperature below initial total temperature, interpolations were made to obtain entropy at the initial total enthalpy. This process was repeated until the approximate temperature at which the entropy downstream of the normal shock was located. Air properties at the initial total enthalpy at eight temperatures in this vicinity were obtained by interpolation. Then another set of interpolations was made to obtain the properties at the desired entropy, representing total conditions downstream of the shock.

Reliability Checks

At several points in the calculations for each expansion or each final data point, checks were made to determine the consistency of results obtained from a series of interpolations. In all cases, the results indicated consistency of better than 0.1 percent. Consistency checks made were the following:

In the isentropic expansion at each temperature, a separate interpolation was made to obtain each of the air properties at the point where entropy was equal to the value at the selected total temperature and pressure. Properties thus obtained were used to calculate the velocity-density product (ρU). Values of velocity-density product thus obtained were used for determining the maximum value of ρU corresponding to the nozzle throat and the air temperature at this point. Another set of interpolations was made to determine the individual air properties at the throat temperature and another value of ρU obtained from these air properties. The two values of ρU at the throat were compared for consistency.

In the isentropic expansion, individual air properties obtained by interpolation at each temperature were used in a second interpolation routine to obtain air properties at each desired Mach number. The total enthalpy indicated by velocity and ambient enthalpy thus obtained at each Mach number was compared for consistency with total enthalpy calculated initially.

Following the procedure previously described for normal shock calculations, pressure and enthalpy from the individual air properties finally calculated were compared with values obtained from the continuity equations for consistency.

After completion of calculations of the desired aerodynamic flow parameters and the rounding off of these parameters for presentation herein, a final consistency check was made. Various tabulated pressure ratios were compared with values indicated by tabulated density, temperature, compressibility factor, and the equation of state. Also, tabulated total enthalpies were compared with values indicated by tabulated ambient enthalpies, tabulated velocities, and the energy equation. These checks indicated consistencies of better than 0.2 percent.

Ratios of many of the flow parameters presented herein to corresponding parameters for perfect gas were calculated. These parameters were then plotted versus Mach number in groups of all stagnation pressures for one stagnation temperature. These plots indicated consistent variations of the parameters with both Mach number and pressure.

In addition to the above-described internal checks, results were compared with available data from other sources.

In Reference 4 are presented calculations of equilibrium isentropic expansions from total temperatures of 4000 to 8000°K at some of the stagnation pressures considered herein. The ambient temperatures for which expansion calculations were made in Reference 4 in several cases correspond to similar calculations of this report. In these cases, including 224 expansions from 10 stagnation conditions, comparisons were made between the two sets of data. The maximum deviations of data contained herein from that of Reference 4 were as follows:

<u>Parameter</u>	<u>Maximum percent deviation</u>
ρ	-7.49 to +4.04
P	-7.53 to +4.14
U	-1.20 to +0.74
M	-0.96 to +1.89
A/A*	-3.84 to +8.16

An examination of the pattern of the deviations indicated two facts. At all stagnation temperatures, the larger deviations occurred in results for expansions to the lower temperatures. Deviations at the higher temperatures were not of significance except in the case of expansions from 8000°K. These facts are indicated by a comparison of the following table with the above table. The following table includes maximum deviations obtained when expansions from stagnation temperatures of 8000°K and expansions to temperatures below 800°K are eliminated:

<u>Parameter</u>	<u>Maximum percent deviation</u>
ρ	-1.19 to +1.35
P	-2.17 to +1.00
U	-0.31 to +0.49
M	-0.96 to +0.98
A/A*	-0.94 to +0.74

In the above table it can be seen that deviations are of little significance. The pattern of the deviations indicate that the air properties used for calculations of Reference 4 differ appreciably from those used herein at temperatures below 800°K and at 8000°K. As previously mentioned for calculations herein, the latest Bureau of Standards air properties data were used directly for calculating flow parameters at and above 1500°K and were used as a reference for defining lower temperature air properties required in the calculations.

In Reference 3 results of calculations of normal shock flow parameters are presented for flight through the atmosphere at several selected altitudes. Each of the 33 sets of stagnation conditions considered herein corresponds to flight simulation at some Mach number and altitude. Of these, 27 correspond to simulated altitudes in the range of Reference 3. For these cases, comparisons were made between data of Reference 3 and that contained herein. Results of these comparisons are as follows:

<u>Parameter</u>	<u>Maximum percent deviation</u>
p_2	-0.66 to +1.80
ρ_2	-1.42 to +2.08
T_2	-3.19 to +1.39
M_2	-1.99 to +0.94

Considering the fact that these comparisons required the use of faired curves of Reference 3, the above deviations are not considered significant. It is noted that air properties data used in Reference 3 were from Reference 5 in which the air model is not as exact as that of Reference 7 used herein.

Presentation of Results

Aerodynamic flow parameters obtained from calculations discussed herein are presented in Table I. An index to the table is presented on page 18, and definitions of flow parameters of the table are presented on page 19. Air properties at the selected temperature and pressure in the stagnation chamber are listed at the top of each page of the tables. The first line in the data list includes flow parameters at the nozzle throat. The following lines include isentropic expansion and normal shock flow parameters for Mach numbers of 2.0 and above in increments of 0.5. At the bottom of each page are presented the altitude and Mach number for which flow parameters of flight are duplicated in the wind tunnel with the selected total pressure and temperature.

In addition to the tables, representative plots have been prepared to illustrate the real gas effects on various aerodynamic flow parameters. Figure 2 illustrates the variation of ratios of real to perfect gas flow parameters with Mach number for various total temperatures at a total pressure of 500 atmospheres. Figure 3 illustrates variations of these ratios with Mach number for various total pressures at a total temperature of 7000°K.

An important point clearly indicated by data of Figures 2 and 3 is the wide range of variations of real gas effects on the various flow parameters. Of the parameters included in Figures 2 and 3, the real gas effects in the range of conditions considered vary from a few percent to more than two orders of magnitude.

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TABLE I

Mach Functions

INDEX TO TABLE I OF MACH FUNCTIONS

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DEFINITIONS OF AIR PROPERTIES AND FLOW PARAMETERS
LISTED IN TABLE I

T_t	Total temperature in stagnation chamber and in isentropic expansion, °K
p_t	Total pressure in stagnation chamber and in isentropic expansion, atmospheres
ρ_t	Total density in stagnation chamber and in isentropic expansion, atmospheres
H_t	Total enthalpy, $\text{ft}^2/\text{sec}^2\text{-}^\circ\text{K}$
Z_t	Compressibility factor in stagnation chamber, mols of air at elevated temperature per mol of air at reference pressure and temperature
S/R_t	Ratio of entropy in stagnation chamber and in isentropic expansion to the universal gas constant
M	Mach number of the flow
U	Velocity of the flow
p/p_t	Ratio of static to total pressure
ρ/ρ_t	Ratio of static to total density
T/T_t	Ratio of static to total temperature
q/p_t	Ratio of dynamic to total pressure
A/A^*	Ratio of local cross-sectional area of nozzle to area at throat
H/H_t	Ratio of ambient to total enthalpy
ρU	Velocity density product, $\text{lb}/\text{ft}^2\text{-sec}$
Z	Compressibility factor at ambient conditions of the flow
M_2	Mach number downstream of a normal shock
U_2/U_1	Velocity ratio across a normal shock
p_2/p_1	Static pressure ratio across a normal shock
ρ_2/ρ_1	Static density ratio across a normal shock
T_2/T_1	Static temperature ratio across a normal shock
H_2/H_1	Static enthalpy ratio across a normal shock
Z_2	Compressibility factor at ambient conditions downstream of a normal shock
p_{t2}/p_t	Ratio of total pressures across a normal shock
ρ_{t2}/ρ_t	Ratio of total densities across a normal shock
T_{t2}/T_t	Ratio of total temperatures across a normal shock
Z_{t2}	Compressibility factor at total conditions downstream of a normal shock
p_{t2}/p_1	Ratio of total pressure downstream of a normal shock to static pressure upstream of the shock
S/R_2	Ratio of entropy downstream of a normal shock to universal gas constant

TABLE I
Mach functions

$T_t = 4000^\circ\text{K}$ $p_t = 100 \text{ atmospheres}$ $\rho_t = 6.64 \text{ atmospheres}$ $H_t = 60.45 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.027$ $S/R_t = 30.583$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9975	3716	.5651E 00	.6221E 00	.9160E 00	.3383E 00	.1000E 01	.8858E 00	.1240E 04	1.019													
2.0	6614	.1303E 00	.1847E 00	.7213E 00	.3183E 00	.1892E 01	.6553E 00	.5442	.3148	.4348E 01	.3177E 01	.1337E 01	.1511E 01	.1.028	.6753E 00	.6798E 00	.9903	1.031	.5184E 01	30.987		
3.0	7663	.5252E-01	.8848E-01	.6093E 00	.2046E 00	.3410E 01	.5143E 00	.3636E 03	1.001	.4670	.2329	.5976E 01	.4293E 01	.1575E 01	.1893E 01	.1.033	.4169E 00	.4232E 00	.9776	1.035	.7936E 01	31.485
3.5	8451	.2084E-01	.4252E-01	.5035E 00	.1196E 00	.6434E 01	.4093E 00	.1927E 03	1.000	.4219	.1899	.1035E 02	.5267E 01	.1883E 01	.2391E 01	.1.038	.2382E 00	.2445E 00	.9621	1.041	.1143E 02	32.065
4.0	9017	.8700E-02	.2155E-01	.4149E 00	.6900E-01	.1190E 02	.3275E 00	.1042E 03	1.000	.3940	.1651	.1424E 02	.6057E 01	.2252E 01	.2998E 01	.1.044	.1357E 00	.1409E 00	.9457	1.046	.1560E 02	32.653
4.5	9434	.3818E-02	.1146E-01	.3422E 00	.4017E-01	.2138E 02	.2638E 00	.5799E 02	1.000	.3752	.1492	.1890E 02	.6702E 01	.2685E 01	.3728E 01	.1.050	.7839E-01	.8240E-01	.9290	1.052	.2053E 02	33.229
5.0	9964	.9054E-03	.3861E-02	.2410E 00	.1510E-01	.6010E 02	.1788E 00	.2063E 02	1.000	.3522	.1307	.2998E 02	.7649E 01	.3694E 01	.5514E 01	.1.061	.2919E-01	.3142E-01	.8981	1.063	.3224E 02	34.273
5.5	10141	.4725E-03	.2377E-02	.2043E 00	.9626E-02	.9592E 02	.1493E 00	.1293E 02	1.000	.3444	.1246	.3665E 02	.8016E 01	.4291E 01	.6611E 01	.1.066	.1856E-01	.2021E-01	.8837	1.068	.3927E 02	34.756
6.0	10279	.2592E-02	.1529E-02	.1747E 00	.6345E-02	.1475E 03	.1261E 01	.8406E 01	1.000	.3384	.1201	.4406E 02	.8324E 01	.4945E 01	.7833E 01	.1.070	.1221E-01	.1344E-01	.8704	1.072	.4710E 02	35.203
6.5	10386	.1492E-03	.1018E-02	.1506E 00	.4323E-02	.2187E 03	.1077E 00	.5668E 01	1.000	.3335	.1164	.5219E 02	.8588E 01	.5655E 01	.9172E 01	.1.074	.8304E-02	.9237E-02	.8582	1.076	.5566E 02	35.617
7.0	10471	.8971E-04	.7032E-03	.1311E 00	.3037E-02	.3139E 03	.9308E-01	.3949E 01	1.000	.3294	.1134	.6099E 02	.8815E 01	.6417E 01	.1062E 02	.1.078	.5827E-02	.6544E-02	.8470	1.080	.6495E 02	35.999
7.5	10539	.5616E-03	.5015E-03	.1151E 00	.2194E-02	.4374E 03	.8131E-01	.2834E 01	1.000	.3260	.1110	.7043E 02	.9013E 01	.7224E 01	.1216E 02	.1.082	.4204E-02	.4764E-02	.8368	1.084	.7487E 02	36.352
8.0	10594	.3636E-04	.3669E-03	.1018E 00	.1622E-02	.5947E 03	.7169E-01	.2085E 01	1.000	.3230	.1088	.8048E 02	.9188E 01	.8074E 01	.1380E 02	.1.085	.3108E-02	.3551E-02	.8274	1.087	.8548E 02	36.681
8.5	10639	.2425E-05	.2745E-03	.9077E-01	.1223E-02	.7917E 03	.6372E-01	.1566E 01	1.000	.3205	.1070	.9109E 02	.9342E 01	.8962E 01	.1552E 02	.1.088	.2343E-02	.2699E-02	.8186	1.090	.9564E 02	36.988
9.0	10677	.1656E-04	.2089E-03	.8143E-01	.9381E-03	.1036E 04	.5702E-01	.1196E 01	1.000	.3182	.1055	.1023E 03	.9482E 01	.9892E 01	.1735E 02	.1.091	.1796E-02	.2084E-02	.8105	1.092	.1084E 03	37.278
9.5	10709	.1155E-04	.1615E-03	.7348E-01	.7296E-03	.1336E 04	.5132E-01	.9277E 00	1.000	.3161	.1040	.1141E 03	.9614E 01	.1086E 02	.1929E 02	.1.093	.1397E-02	.1632E-02	.8028	1.095	.1209E 03	37.553
10.0	10737	.8205E-05	.1265E-03	.6664E-01	.5744E-03	.1702E 04	.4642E-01	.7284E 00	1.000	.3142	.1027	.1266E 03	.9736E 01	.1187E 02	.2132E 02	.1.096	.1100E-02	.1294E-02	.7956	1.097	.1340E 03	37.815
10.5	10761	.5918E-05	.1002E-03	.6070E-01	.4568E-03	.2145E 04	.4217E-01	.5781E 00	1.000	.3127	.1016	.1396E 02	.9842E 01	.1292E 02	.2348E 02	.1.098	.8738E-03	.1035E-02	.7888	1.100	.1476E 03	38.068
11.0	10782	.4330E-05	.8014E-04	.5551E-01	.3669E-03	.2675E 04	.3847E-01	.4634E 00	1.000	.3111	.1005	.1534E 03	.9949E 01	.1401E 02	.2575E 02	.1.100	.7019E-03	.8366E-03	.7823	1.102	.1621E 03	38.309
11.5	10800	.3213E-05	.6476E-04	.5097E-01	.2975E-03	.3305E 04	.3522E-01	.3751E 00	1.000	.3098	.0996	.1677E 03	.1004E 02	.1514E 02	.2812E 02	.1.102	.5691E-03	.6825E-03	.7761	1.104	.1771E 03	38.540
12.0	10816	.2410E-05	.5274E-04	.4695E-01	.2430E-03	.4053E 04	.3234E-01	.3059E 00	1.000	.3085	.0986	.1827E 03	.1014E 02	.1632E 02	.3063E 02	.1.104	.4647E-03	.5606E-03	.7703	1.106	.1929E 03	38.764
12.5	10830	.1827E-05	.4328E-04	.4338E-01	.1999E-03	.4932E 04	.2979E-01	.2514E 00	1.000	.3072	.0978	.1984E 03	.1023E 02	.1754E 02	.3326E 02	.1.106	.3823E-03	.4638E-03	.7647	1.108	.2092E 03	38.980
13.0	10843	.1401E-05	.3580E-04	.4020E-01	.1856E-03	.5956E 04	.2752E-01	.2082E 00	1.000	.3059	.0970	.2147E 03	.1031E 02	.1879E 02	.3601E 02	.1.108	.3170E-03	.3867E-03	.7593	1.109	.2226E 03	39.188
13.5	10854	.1084E-05	.2981E-04	.3736E-01	.1383E-03	.7145E 04	.2549E-01	.1735E 00	1.000	.3049	.0962	.2319E 03	.1039E 02	.2009E 02	.3888E 02	.1.109	.2646E-03	.3244E-03	.7542	1.111	.2441E 03	39.388
14.0	10864	.8457E-06	.2497E-04	.3480E-01	.1161E-03	.8522E 04	.2366E-01	.1455E 00	1.000	.3038	.0955	.2492E 03	.1047E 02	.2142E 02	.4189E 02	.1.111	.2221E-03	.2737E-03	.7493	1.113	.2626E 03	39.583
14.5	10873	.6655E-05	.2104E-04	.3250E-01	.9799E-04	.1010E 05	.2201E-01	.1227E 00	1.000	.3028	.0949	.2674E 03	.1054E 02	.2280E 02	.4503E 02	.1.112	.1875E-03	.2321E-03	.7446	1.114	.2817E 03	39.772
15.0	10882	.5279E-04	.1783E-04	.3041E-01	.8317E-04	.1184E 05	.2052E-01	.1041E 00	1.000	.3018	.0942	.2863E 03	.1061E 02	.2422E 02	.4831E 02	.1.114	.1591E-03	.1980E-03	.7401	1.116	.3014E 03	39.955
15.5	10889	.4217E-06	.1519E-04	.2852E-01	.7095E-04	.1397E 03	.1917E-01	.8872E-01	1.000	.3009	.0937	.3057E 03	.1068E 02	.2567E 02	.5172E 02	.1.115	.1357E-03	.1696E-03	.7358	1.117	.3217E 03	40.132
16.0	10896	.3393E-06	.1301E-04	.2680E-01	.6682E-04	.1631E 05	.1794E-01	.7601E-01	1.000	.2998	.0930	.3262E 03	.1075E 02	.2717E 02	.5527E 02	.1.117	.1164E-03	.1462E-03	.7316	1.118	.3431E 03	40.303
16.5	10902	.2747E-06	.1119E-04	.2523E-01	.5236E-04	.1696E 05	.1682E-01	.6540E-01	1.000	.2990	.0925	.3469E 03	.1081E 02	.2871E 02	.5897E 02	.1.118	.1003E-03	.1264E-03	.7276	1.120	.3650E 03	40.471

ALTITUDE OF 159,900 FEET SIMULATED AT MACH 9.70

Table I continued

$T_t = 4000^{\circ}\text{K}$ $P_t = 200 \text{ atmospheres}$ $\rho_t = 13.39 \text{ atmospheres}$ $H_t = 59.05 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.020$ $S/R_t = 29.760$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9985	3709	.5632E 00	.6221E 00	.9114E 00	.3397E 00	.1000E 01	.8835E 00	.2494E 04	1.013													
2.0	6574	.1301E 00	.1866E 00	.7086E 00	.1879E 01	.6340E 00	.1327E 04	.0003 .5464	.3179 .4357E 01	.3146E 01	.1519E 01	.1519E 01	.1.020	.6785E 00	.6820E 00	.9922	1.022	.5213E 01	30.157			
2.5	7597	.5295E-01	.9058E-01	.5957E 00	.2075E 00	.3353E 01	.5112E 00	.7437E 03	.0001 .4709	.2368 .6982E 01	.4224E 01	.1615E 01	.1903E 01	1.024	.4220E 00	.4272E 00	.9817	1.026	.7970E 01	30.642		
3.0	8363	.2128E-01	.4410E-01	.4919E 00	.1224E 00	.6236E 01	.4077E 00	.3986E 03	.0000 .4266	.1941 .1027E 02	.5152E 01	.1938E 01	.2398E 01	1.029	.2434E 00	.2486E 00	.9685	1.031	.1144E 02	31.208		
3.5	8918	.8948E-02	.2251E-01	.4053E 00	.7104E-01	.3265E 02	.2169E 03	.0000 .3988	.1692 .1419E 02	.5909E 01	.2323E 01	.3003E 01	1.034	.1395E 00	.1439E 00	.9542	1.036	.1558E 02	31.783			
4.0	9327	.3948E-02	.1204E-01	.3345E 00	.4156E-01	.2056E 02	.2633E 00	.1213E 03	.0000 .3801	.1533 .1882E 02	.6525E 01	.2776E 01	.3732E 01	1.039	.8090E-01	.8437E-01	.9393	1.041	.2049E 02	32.349		
4.5	9624	.1879E-02	.6854E-02	.2796E 00	.2519E-01	.3498E 02	.2157E 00	.0000 .3671	.1429 .7129E 02	.7017E 01	.3273E 01	.4562E 01	1.044	.4880E-01	.5144E-01	.9248	1.046	.2597E 02	32.876			
5.0	9851	.9365E-02	.4060E-02	.2352E 00	.1563E-01	.5770E 02	.1783E 00	.4322E 02	.0000 .3574	.1346 .2588E 02	.7479E 01	.3834E 01	.5526E 01	1.049	.3016E-01	.3214E-01	.9106	1.051	.3220E 02	33.381		
5.5	10026	.4894E-03	.2503E-02	.1994E 00	.9985E-02	.9195E 02	.1488E 00	.2712E 02	.0000 .3496	.1285 .3656E 02	.7780E 01	.4459E 01	.6625E 01	1.054	.1922E-01	.2070E-01	.8971	1.055	.3927E 02	33.855		
6.0	10161	.2691E-03	.1610E-02	.1704E 00	.6596E-02	.1411E 03	.1257E 00	.1768E 02	.0000 .3436	.1239 .4393E 02	.8070E 01	.5145E 01	.7848E 01	1.058	.1266E-01	.1378E-01	.8844	1.060	.4706E 02	34.297		
6.5	10267	.1551E-03	.1076E-02	.1470E 00	.4502E-02	.2089E 03	.1074E 00	.1194E 02	.0000 .3387	.1202 .5205E 02	.8321E 01	.5890E 01	.9187E 01	1.062	.8634E-02	.9484E-02	.8726	1.064	.5566E 02	34.703		
7.0	10350	.9353E-04	.7456E-03	.1279E 00	.3169E-02	.2991E 03	.9291E-01	.8340E 01	.1.000 .3348	.1172 .6818E 02	.8534E 01	.6686E 01	.1063E 02	1.066	.6071E-02	.6729E-02	.8617	1.068	.6490E 02	35.078		
7.5	10416	.5866E-04	.5323E-03	.1123E 00	.2293E-02	.4161E 03	.8119E-01	.5959E 01	.1.000 .3314	.1146 .7021E 02	.8723E 01	.7528E 01	.1217E 02	1.069	.4389E-02	.4907E-02	.8517	1.071	.7483E 02	35.425		
8.0	10471	.3803E-04	.3901E-03	.9942E-01	.1697E-02	.5649E 03	.7161E-01	.4415E 01	.1.000 .3285	.1125 .8019E 02	.8887E 01	.8416E 01	.1380E 02	1.072	.3246E-02	.3658E-02	.8425	1.074	.8536E 02	35.748		
8.5	10515	.2539E-03	.2921E-03	.8686E-01	.1282E-02	.7513E 03	.6367E-01	.3320E 01	.1.000 .3259	.1107 .9577E 02	.9035E 01	.9344E 01	.1553E 02	1.075	.2450E-02	.2782E-02	.8338	1.077	.9649E 02	36.051		
9.0	10553	.1736E-04	.2225E-03	.7954E-01	.9833E-03	.9828E 03	.5698E-01	.2593E 01	.1.000 .3238	.1091 .1019E 03	.9166E 01	.1031E 02	.1735E 02	1.078	.1879E-02	.2149E-02	.8257	1.080	.1089E 03	36.338		
9.5	10585	.1211E-04	.1720E-03	.7177E-01	.7649E-03	.1267E 04	.5128E-01	.1968E 01	.1.000 .3217	.1076 .1137E 03	.9290E 01	.1133E 02	.1928E 02	1.081	.1461E-02	.1683E-02	.8181	1.082	.1207E 03	36.609		
10.0	10612	.8606E-05	.1348E-03	.6510E-01	.6024E-03	.1613E 04	.4640E-01	.1546E 01	.1.000 .3199	.1064 .1261E 03	.9402E 01	.1239E 02	.2132E 02	1.083	.1151E-02	.1334E-02	.8109	1.085	.1337E 03	36.869		
10.5	10636	.6206E-05	.1067E-03	.5929E-01	.4791E-03	.2033E 04	.4214E-01	.1227E 01	.1.000 .3181	.1051 .1392E 03	.9513E 01	.1348E 02	.2348E 02	1.085	.9154E-03	.1068E-02	.8040	1.087	.1475E 03	37.117		
11.0	10656	.4542E-05	.8541E-04	.5423E-01	.3484E-03	.2535E 04	.3844E-01	.9836E 00	.1.000 .3167	.1041 .1528E 03	.9610E 01	.1462E 02	.2574E 02	1.087	.7352E-03	.8630E-03	.7975	1.089	.1618E 03	37.355		
11.5	10674	.3370E-05	.6901E-04	.4979E-01	.3120E-03	.3133E 04	.3519E-01	.7961E 00	.1.000 .3153	.1031 .1670E 03	.9701E 01	.1580E 02	.2812E 02	1.089	.5958E-03	.7035E-03	.7913	1.091	.1768E 03	37.584		
12.0	10690	.2527E-05	.5619E-04	.4586E-01	.2548E-03	.3842E 04	.3231E-01	.6491E 00	.1.000 .3140	.1021 .1820E 03	.9790E 01	.1703E 02	.3064E 02	1.091	.4854E-03	.5777E-03	.7853	1.093	.1925E 03	37.806		
12.5	10704	.1917E-05	.4612E-04	.4237E-01	.2097E-03	.4674E 04	.2976E-01	.5336E 00	.1.000 .3126	.1012 .1977E 03	.9880E 01	.1830E 02	.3327E 02	1.093	.4007E-03	.4978E-03	.7797	1.095	.2090E 03	38.018		
13.0	10717	.1469E-05	.3815E-04	.3927E-01	.1739E-03	.5644E 04	.2749E-01	.4419E 00	.1.000 .3115	.1004 .2138E 03	.9958E 01	.1961E 02	.3602E 02	1.095	.3322E-03	.3988E-03	.7743	1.097	.2261E 03	38.223		
13.5	10728	.1137E-05	.3176E-04	.3649E-01	.1451E-03	.6772E 04	.2546E-01	.3683E 00	.1.000 .3104	.0996 .2307E 03	.1004E 02	.2096E 02	.3890E 02	1.097	.2771E-03	.3344E-03	.7691	1.099	.2438E 03	38.422		
14.0	10738	.8871E-06	.2661E-04	.3339E-01	.1217E-03	.8077E 04	.2363E-01	.3088E 00	.1.000 .3093	.0989 .2483E 03	.1011E 02	.2236E 02	.4192E 02	1.098	.2325E-03	.2820E-03	.7641	1.100	.2621E 03	38.615		
14.5	10747	.6981E-06	.2242E-04	.3174E-01	.1028E-03	.9575E 04	.2198E-01	.2605E 00	.1.000 .3083	.0982 .2665E 03	.1018E 02	.2280E 02	.4506E 02	1.100	.1963E-03	.2393E-03	.7593	1.102	.2812E 03	38.802		
15.0	10755	.5557E-06	.1900E-04	.2971E-01	.8724E-04	.1129E 05	.2049E-01	.2209E 00	.1.000 .3073	.0976 .2853E 03	.1025E 02	.2527E 02	.4834E 02	1.102	.1667E-03	.2041E-03	.7547	1.103	.3010E 03	38.982		
15.5	10762	.4423E-06	.1619E-04	.2786E-01	.7441E-04	.1324E 05	.1914E-01	.1883E 00	.1.000 .3063	.0969 .3048E 03	.1031E 02	.2679E 02	.5176E 02	1.103	.1423E-03	.1750E-03	.7503	1.105	.3216E 03	39.157		
16.0	10769	.3558E-06	.1386E-04	.2618E-01	.6379E-04	.1546E 05	.1791E-01	.1613E 00	.1.000 .3055	.0964 .3249E 03	.1037E 02	.2835E 02	.5532E 02	1.104	.1219E-03	.1507E-03	.7460	1.106	.3426E 03	39.328		

ALTITUDE OF 141,800 FEET SIMULATED AT MACH 9.80

Table I continued

$T_t = 4000^{\circ}\text{K}$ $p_t = 500 \text{ atmospheres}$ $\rho_t = 3.371 \text{ atmospheres}$ $H_t = 57.76 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.012$ $S/R_t = 28.724$

M	U	p/p_t	ρ/p_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	ρ_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	ρ_{t2}/p_1	S/R_2	
0.9988	3705	.5612E 00	.6222E 00	.9061E 00	.3414E-00	.1000E 01	.8812E 00	.6273E 04	1.008													
2.0	6532	.1302E 00	.1892E 00	.6960E 00	.3226E 00	.1866E 01	.6306E 00	.3382E 04	1.001	.5485	.3214	.4362E 01	.3112E 01	.1386E 01	.1525E 01	.1.013	.6823E 00	.6848E 00	.9945	1.014	.5240E 01	29.115
2.5	7535	.5325E-01	.9250E-01	.5827E 00	.2099E 00	.3307E 01	.5084E 00	.1897E 04	1.000	.4749	.2408	.6985E 01	.4154E 01	.1656E 01	.1911E 01	1.016	.4265E 00	.4986E	1.017	.8010E 01	29.591	
3.0	8279	.2173E-01	.4569E-01	.4816E 00	.1252E 00	.6094E 01	.4066E 00	.1029E 04	1.000	.4310	.1985	.1023E 02	.5038E 01	.1992E 01	.2402E 01	1.019	.2485E 00	.2524E 00	.9763	1.021	.1143E 02	30.139
3.5	8826	.9160E-02	.2339E-01	.3965E 00	.7828E-01	.1117E 02	.3256E 00	.5617E 03	1.000	.4034	.1786	.1413E 02	.5761E 01	.2397E 01	.3009E 01	1.023	.1426E 00	.1460E 00	.9646	1.025	.1556E 02	30.707
4.0	9227	.4067E-02	.1258E-01	.3274E 00	.4280E-01	.1986E 02	.2628E 00	.3158E 03	1.000	.3848	.1576	.3873E 02	.6346E 01	.2871E 01	.3735E 01	1.028	.8316E-01	.8589E-01	.9223	1.029	.2045E 02	31.261
4.5	9521	.1932E-02	.7156E-02	.2734E 00	.2599E-01	.3383E 02	.2151E 00	.1854E 03	1.000	.3721	.1468	.2394E 02	.6814E 01	.3398E 01	.4570E 01	1.032	.5011E-01	.5222E-01	.9398	1.034	.2593E 02	31.784
5.0	9745	.9639E-03	.4244E-02	.2299E 00	.1611E-01	.5573E 02	.1778E 00	.1126E 03	1.000	.3625	.1389	.2978E 02	.7201E 01	.3990E 01	.5536E 01	1.036	.3103E-01	.3264E-01	.9272	1.038	.3219E 02	32.281
5.5	9918	.5046E-03	.2622E-02	.1948E 00	.1031E-01	.8864E 02	.1489E 00	.7077E 02	1.000	.3549	.1328	.3643E 02	.7529E 01	.4650E 01	.6637E 01	1.041	.1983E-01	.2102E-01	.9150	1.042	.3923E 02	32.748
6.0	10051	.2780E-03	.1690E-02	.1666E 00	.6823E-02	.1357E 03	.1254E 00	.4622E 02	1.000	.3491	.1282	.4379E 02	.7802E 01	.5373E 01	.7860E 01	1.045	.1308E-01	.1401E-01	.9033	1.046	.4704E 02	33.181
6.5	10155	.1605E-03	.1132E-02	.1436E 00	.4665E-02	.2006E 03	.1072E 02	1.000	.3444	.1245	.5188E 02	.8035E 01	.6158E 01	.9198E 01	1.048	.8929E-02	.9648E-02	.8923	1.050	.5562E 02	33.581	
7.0	10237	.9702E-04	.7856E-03	.1250E 00	.3291E-02	.2866E 03	.9275E-01	.2188E 02	1.000	.3406	.1215	.6057E 02	.8231E 01	.6996E 01	.1064E 02	1.052	.6289E-02	.6851E-02	.8821	1.054	.6482E 02	33.950
7.5	10302	.6095E-04	.5620E-03	.1098E 00	.2384E-02	.3981E 03	.8109E-01	.1576E 02	1.000	.3372	.1190	.6992E 02	.8406E 01	.7883E 01	.1217E 02	1.055	.4555E-02	.5001E-02	.8725	1.057	.7474E 02	34.290
8.0	10356	.3957E-04	.4122E-03	.9719E-01	.1767E-02	.5400E 03	.7154E-01	.1162E 02	1.000	.3343	.1168	.7986E 02	.8560E 01	.8817E 01	.1380E 02	1.058	.3374E-02	.3732E-02	.8636	1.060	.8525E 02	34.607
8.5	10400	.2644E-04	.3089E-03	.8668E-01	.1335E-02	.7176E 03	.6362E-01	.8741E 01	1.000	.3320	.1150	.9036E 02	.8697E 01	.9793E 01	.1552E 02	1.061	.2548E-02	.2838E-02	.8552	1.063	.9635E 02	34.905
9.0	10437	.1809E-04	.2354E-03	.7779E-01	.1025E-02	.9382E 03	.5694E-01	.5686E 01	1.000	.3300	.1134	.1014E 03	.8819E 01	.1081E 02	.1735E 02	1.064	.1955E-02	.2192E-02	.8473	1.065	.1081E 03	35.187
9.5	10468	.1263E-04	.1821E-03	.7020E-01	.7975E-03	.1209E 04	.5125E-01	.5187E 01	1.000	.3280	.1119	.1131E 03	.8933E 01	.1188E 02	.1928E 02	1.066	.1520E-02	.1716E-02	.8397	1.068	.1204E 03	35.455
10.0	10495	.8972E-05	.1427E-03	.6367E-01	.6281E-03	.1540E 04	.4637E-01	.4074E 01	1.000	.3261	.1106	.1255E 03	.9044E 01	.1299E 02	.2132E 02	1.069	.1197E-02	.1360E-02	.8326	1.070	.1335E 03	35.711
10.5	10519	.6471E-05	.1130E-03	.5799E-01	.4996E-03	.1940E 04	.4211E-01	.3233E 01	1.000	.3245	.1094	.1385E 03	.9141E 01	.1414E 02	.2347E 02	1.071	.9523E-03	.1088E-02	.8258	1.073	.1472E 03	35.956
11.0	10539	.4737E-05	.9042E-04	.5305E-01	.4014E-03	.2419E 04	.3841E-01	.2593E 01	1.000	.3229	.1083	.1521E 03	.9237E 01	.1534E 02	.2574E 02	1.073	.7653E-03	.8799E-03	.8193	1.075	.1616E 03	36.191
11.5	10557	.3514E-05	.7305E-04	.4870E-01	.3254E-03	.2989E 04	.3516E-01	.2098E 01	1.000	.3216	.1073	.1662E 03	.9320E 01	.1659E 02	.2812E 02	1.075	.6200E-03	.7168E-03	.8130	1.077	.1764E 03	36.418
12.0	10572	.2635E-05	.5947E-04	.4485E-01	.2657E-03	.3666E 04	.3229E-01	.1731E 01	1.000	.3202	.1063	.1812E 03	.9408E 01	.1788E 02	.3064E 02	1.077	.5064E-03	.5888E-03	.8071	1.079	.1922E 03	36.636
12.5	10586	.1999E-05	.4883E-04	.4145E-01	.2187E-03	.4446E 04	.2974E-01	.11407E 01	1.000	.3189	.1054	.1967E 03	.9488E 01	.1922E 02	.3327E 02	1.079	.4170E-03	.4875E-03	.8013	1.081	.2086E 03	36.846
13.0	10599	.1532E-05	.4039E-04	.3841E-01	.1813E-03	.5386E 04	.2747E-01	.11656E 01	1.000	.3178	.1046	.2219E 03	.9562E 01	.2059E 02	.3602E 02	1.081	.3457E-03	.4062E-03	.7959	1.083	.2256E 03	37.048
13.5	10610	.1185E-05	.3362E-04	.3569E-01	.1513E-03	.6462E 04	.2543E-01	.9707E 00	1.000	.3167	.1038	.2297E 03	.9635E 01	.2202E 02	.3891E 02	1.083	.2884E-03	.3405E-03	.7906	1.084	.2433E 03	37.245
14.0	10620	.9250E-06	.2816E-04	.3325E-01	.1270E-03	.7707E 04	.2360E-01	.8139E 00	1.000	.3158	.1031	.2471E 03	.9701E 01	.2349E 02	.4193E 02	1.084	.2420E-03	.2871E-03	.7855	1.086	.2616E 03	37.435
14.5	10629	.7280E-06	.2374E-04	.3105E-01	.1072E-03	.9137E 04	.2196E-01	.6865E 00	1.000	.3147	.1024	.2652E 03	.9769E 01	.2500E 02	.4508E 02	1.086	.2043E-03	.2434E-03	.7806	1.088	.2807E 03	37.619
15.0	10637	.5775E-06	.2012E-04	.2906E-01	.9098E-04	.1077E 05	.2047E-01	.5624E 00	1.000	.3137	.1017	.2840E 03	.9835E 01	.2655E 02	.4836E 02	1.088	.1735E-03	.2079E-03	.7759	1.089	.3005E 03	37.796
15.5	10644	.4613E-06	.1714E-04	.2725E-01	.7760E-04	.1264E 05	.1911E-01	.4964E 00	1.000	.3130	.1011	.3032E 03	.9892E 01	.2815E 02	.5179E 02	1.089	.1480E-03	.1780E-03	.7714	1.091	.3207E 03	37.970
16.0	10651	.3709E-06	.1466E-04	.2961E-01	.6649E-04	.1476E 05	.1788E-01	.4290E 00	1.000	.3119	.1004	.3235E 03	.9957E 01	.2979E 02	.5537E 02	1.091	.1268E-03	.1533E-03	.7670	1.092	.3419E 03	38.139

ALTITUDE OF 121,700 FEET SIMULATED AT MACH 10.05

Table I continued

$T_t = 4000^{\circ}\text{K}$ $p_t = 1000 \text{ atmospheres}$ $p_t = 67.67 \text{ atmospheres}$ $H_t = 57.09 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.009$ $S/R_t = 27.969$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9995	3703	.5604E 00	.6228E 00	.9029E 00	.3427E 00	.1000E 01	.8799E 00	.1260E 05	1.005													
2.0	6508	.1305E 00	.1908E 00	.6892E 00	.3242E 00	.1857E 01	.6290E 00	.6784E 04	1.001	.5502	.3236	.4361E 01	.3090E 01	.1400E 01	.1528E 01	1.009	.6850E 00	.6868E 00	.9960	1.010	.5250E 01	28.355
2.5	7826	.5357E-01	.9376E-01	.5763E 00	.2116E 00	.5073E 00	.3842E 04	.1.000	.4760	.2431	.6978E 01	.4113E 01	.1678E 01	.1914E 01	1.011	.4300E 00	.4329E 00	.9899	1.012	.8027E 01	28.826	
3.0	8236	.2193E-01	.4647E-01	.4760E 00	.1265E 00	.6026E 01	.4058E 00	.2091E 04	1.000	.4332	.2009	.1022E 02	.4978E 01	.2024E 01	.2405E 01	1.014	.2511E 00	.2524E 00	.9815	1.015	.1145E 02	29.369
3.5	8778	.9263E-02	.2384E-01	.3919E 00	.7370E-01	.1102E 02	.3250E 00	.1143E 04	1.000	.4061	.1761	.1411E 02	.5679E 01	.2441E 01	.3012E 01	1.018	.1442E 00	.1469E 00	.9717	1.019	.1556E 02	29.932
4.0	9175	.4128E-02	.1236E-01	.3237E 00	.4344E-01	.1954E 02	.2626E 00	.6447E 03	1.000	.3877	.1602	.1867E 02	.6242E 01	.2929E 01	.3736E 01	1.021	.8426E-01	.8646E-01	.9612	1.023	.2041E 02	30.480
4.5	9468	.1960E-02	.7317E-02	.2701E 00	.2632E-01	.3329E 02	.2148E 00	.3785E 03	1.000	.3746	.1494	.2384E 02	.6694E 01	.3474E 01	.4457E 01	1.025	.5079E-01	.5251E-01	.9504	1.026	.2591E 02	30.999
5.0	9690	.9781E-03	.4342E-02	.2272E 00	.1636E-01	.5481E 02	.1775E 00	.2299E 03	1.000	.3654	.1415	.2971E 02	.7565E 01	.4087E 01	.5541E 01	1.029	.3145E-01	.3278E-01	.9393	1.030	.3215E 02	31.492
5.5	9861	.5127E-03	.2686E-02	.1925E 00	.1048E-01	.8708E 02	.1482E 00	.1447E 03	1.000	.3583	.1356	.3632E 02	.7374E 01	.4770E 01	.6642E 01	1.033	.2010E-01	.2121E-01	.9282	1.034	.3920E 02	31.954
6.0	9993	.2827E-03	.1733E-02	.1645E 00	.6594E-02	.1323E 03	.1252E 00	.9461E 02	1.000	.3525	.1310	.4368E 02	.7536E 01	.5520E 01	.7865E 01	1.036	.1329E-01	.1408E-01	.9174	1.038	.4701E 02	32.382
6.5	10097	.1634E-03	.1116E-02	.1419E 00	.4752E-02	.1966E 03	.1071E 00	.6408E 02	1.000	.3479	.1273	.5174E 02	.7856E 01	.6334E 01	.9203E 01	1.040	.9080E-02	.9694E-02	.9072	1.041	.5556E 02	32.778
7.0	10178	.9887E-04	.8073E-03	.1235E 00	.3355E-02	.2807E 03	.9267E-01	.4489E 02	1.000	.3442	.1243	.6041E 02	.8043E 01	.7201E 01	.1054E 02	1.043	.6405E-02	.6889E-02	.8976	1.045	.6478E 02	33.142
7.5	10243	.6217E-04	.5790E-03	.1085E 00	.2433E-02	.3896E 03	.8103E-01	.3234E 02	1.000	.3410	.1218	.6973E 02	.8209E 01	.8119E 01	.1217E 02	1.046	.5028E-02	.5888E	1.048	.7465E 02	33.479	
8.0	10296	.4040E-04	.4242E-03	.9605E-01	.1804E-02	.5281E 03	.7150E-01	.2386E 02	1.000	.3383	.1197	.7960E 02	.8352E 01	.9085E 01	.1360E 02	1.049	.3438E-02	.3751E-02	.8799	1.051	.8511E 02	33.794
8.5	10340	.2701E-04	.3179E-03	.8566E-01	.1364E-02	.7016E 03	.6359E-01	.1796E 02	1.000	.3358	.1179	.9008E 02	.8483E 01	.1010E 02	.1552E 02	1.052	.2599E-02	.2854E-02	.8719	1.053	.9625E 02	34.088
9.0	10376	.1848E-04	.2424E-03	.7688E-01	.1047E-02	.9170E 03	.5692E-01	.1374E 02	1.000	.3337	.1163	.1011E 03	.8600E 01	.1115E 02	.1734E 02	1.054	.1994E-02	.2204E-02	.8641	1.056	.1079E 03	34.367
9.5	10408	.1290E-04	.1875E-03	.6938E-01	.8149E-03	.1182E 04	.5124E-01	.1066E 02	1.000	.3319	.1148	.1128E 03	.8708E 01	.1225E 02	.1927E 02	1.057	.1955E-02	.1725E-02	.8568	1.059	.1203E 03	34.633
10.0	10434	.9168E-05	.1469E-03	.6293E-01	.6418E-03	.1505E 04	.4635E-01	.8375E 01	1.000	.3301	.1135	.1251E 03	.8812E 01	.1340E 02	.2131E 02	1.059	.1222E-02	.1367E-02	.8493	1.061	.1333E 02	34.886
10.5	10458	.6112E-05	.1163E-03	.5732E-01	.5104E-03	.1896E 04	.4212E-01	.6647E 01	1.000	.3287	.1123	.1380E 03	.8932E 01	.1460E 02	.2347E 02	1.062	.9714E-03	.1093E-02	.8430	1.063	.1469E 03	35.129
11.0	10478	.4842E-05	.9314E-04	.5243E-01	.4102E-03	.2364E 04	.3844E-01	.5331E 01	1.000	.3271	.1112	.1516E 03	.8994E 01	.1584E 02	.2573E 02	1.064	.7807E-03	.8835E-03	.8366	1.065	.1612E 03	35.362
11.5	10495	.3591E-05	.7523E-04	.4814E-01	.3325E-03	.2921E 04	.3515E-01	.4314E 01	1.000	.3259	.1102	.1657E 03	.9074E 01	.1713E 02	.2812E 02	1.066	.6326E-03	.7197E-03	.8304	1.068	.1762E 03	35.587
12.0	10511	.2692E-05	.6125E-04	.4433E-01	.2715E-03	.3583E 04	.3227E-01	.3517E 01	1.000	.3245	.1092	.1806E 03	.9156E 01	.1847E 02	.3063E 02	1.068	.5168E-03	.5911E-03	.8244	1.070	.1920E 03	35.803
12.5	10525	.2043E-05	.5029E-04	.4097E-01	.2235E-03	.4357E 04	.2972E-01	.2892E 01	1.000	.3232	.1083	.1961E 03	.9234E 01	.1985E 02	.3326E 02	1.070	.4256E-03	.4893E-03	.8187	1.071	.2093E 03	36.011
13.0	10537	.1566E-05	.4160E-04	.3797E-01	.1853E-03	.5262E 04	.2745E-01	.2395E 01	1.000	.3221	.1075	.2122E 03	.9344E 01	.2128E 02	.3602E 02	1.072	.3957E-03	.4075E-03	.8132	1.073	.2252E 03	36.212
13.5	10548	.1211E-05	.3463E-04	.3528E-01	.1546E-03	.6315E 04	.2542E-01	.1995E 01	1.000	.3210	.1067	.2289E 03	.9372E 01	.2275E 02	.3891E 02	1.073	.2942E-03	.3416E-03	.8079	1.075	.2429E 03	36.407
14.0	10558	.9453E-06	.2901E-04	.3287E-01	.1297E-03	.7531E 04	.2359E-01	.1673E 01	1.000	.3198	.1059	.2464E 03	.9442E 01	.2428E 02	.4193E 02	1.075	.2471E-03	.3883E-03	.8028	1.077	.2614E 03	36.595
14.5	10567	.7440E-06	.2445E-04	.3069E-01	.1095E-03	.8928E 04	.2194E-01	.1411E 01	1.000	.3189	.1052	.2644E 03	.9503E 01	.2584E 02	.4508E 02	1.077	.2086E-03	.2445E-03	.7979	1.078	.2804E 03	36.777
15.0	10575	.5901E-06	.2072E-04	.2872E-01	.9297E-04	.1053E 05	.2045E-01	.1197E 01	1.000	.3179	.1045	.2831E 03	.9566E 01	.2745E 02	.4337E 02	1.078	.1771E-03	.2085E-03	.7932	1.080	.3001E 03	36.954
15.5	10582	.4714E-06	.1765E-04	.2694E-01	.7931E-04	.1235E 05	.1910E-01	.1020E 01	1.000	.3171	.1039	.3024E 03	.9623E 01	.2910E 02	.5181E 02	1.080	.1510E-03	.1786E-03	.7886	1.082	.3203E 03	37.126
16.0	10589	.3792E-06	.1511E-04	.2531E-01	.6798E-04	.1442E 05	.1787E-01	.8741E 00	1.000	.3162	.1033	.3224E 03	.9680E 01	.3089E 02	.5538E 02	1.081	.1294E-03	.1537E-03	.7841	1.083	.3414E 03	37.293

ALTITUDE OF 107,900 FEET SIMULATED AT MACH 10.26

Table I continued

$T_t = 5000^{\circ}\text{K}$ $p_t = 100 \text{ atmospheres}$ $\rho_t = 5.00 \text{ atmospheres}$ $H_t = 87.95 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.093$ $S/R_t = 32.563$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_t	S/R_2
0.9987	4288	.5638E 00	.6238E 00	.9162E 00	.3398E 00	.1000E 01	.8955E 00	.1079E 04	1.078													
2.0	7565	.1349E 00	.1886E 00	.7492E 00	.3197E 00	.1875E 01	.6746E 00	.5755E 03	1.043	.5402	.3169	.4237E 01	.3156E 01	.1280E 01	.1434E 01	1.095	.6805E 00	.6868E 00	.9848	1.100	.5044E 01	32.985
2.5	8807	.9469E-01	.8797E-01	.6626E 00	.2021E 00	.3452E 01	.5590E 00	.3125E 03	1.025	.4578	.2302	.6689E 01	.4344E 01	.1429E 01	.1747E 01	1.105	.4149E 00	.4238E 00	.9653	1.108	.7586E 01	33.531
3.0	9835	.2042E-01	.3840E-01	.5750E 00	.1100E 00	.7083E 01	.4501E 00	.1523E 03	1.011	.4044	.1813	.9821E 01	.5516E 01	.1612E 01	.2182E 01	1.116	.2214E 00	.2298E 00	.9409	1.119	.1084E 02	34.231
3.5	10649	.7430E-02	.1668E-01	.4857E 00	.45601E-01	.1506E 02	.3593E 00	.7162E 02	1.003	.3700	.1518	.1379E 02	.6586E 01	.1860E 01	.2773E 01	1.128	.1113E 00	.1176E 00	.9148	1.131	.1497E 02	35.004
4.0	11243	.2877E-02	.7814E-02	.4023E 00	.2926E-01	.3045E 02	.2813E 00	.3544E 02	1.000	.3476	.1340	.1861E 02	.7461E 01	.2191E 01	.3509E 01	1.139	.5757E-01	.6189E-01	.8909	1.141	.2001E 02	35.753
4.5	11653	.1262E-02	.4109E-02	.3356E 00	.1653E-01	.5586E 02	.2280E 00	.1932E 02	1.000	.3328	.1230	.2397E 02	.6127E 01	.2569E 01	.4335E 01	1.148	.3234E-01	.3529E-01	.8710	1.150	.2563E 02	36.413
5.0	11956	.5954E-03	.2308E-02	.2819E 00	.9774E-02	.9693E 02	.1873E 00	.1113E 02	1.000	.3224	.1154	.3003E 02	.8664E 01	.2999E 01	.5281E 01	1.156	.1904E-01	.2106E-01	.8535	1.158	.3197E 02	37.025
5.5	12177	.3071E-03	.1395E-02	.2405E 00	.6129E-02	.1574E 03	.1570E 00	.6854E 01	1.000	.3145	.1100	.3652E 02	.9092E 01	.3456E 01	.6305E 01	1.162	.1191E-01	.1333E-01	.8389	1.164	.3877E 02	37.570
6.0	12352	.1646E-03	.8714E-03	.2064E 00	.3938E-02	.2485E 03	.1325E 00	.4342E 01	1.000	.3080	.1057	.4379E 02	.9457E 01	.3964E 01	.7471E 01	1.168	.7636E-02	.8640E-02	.8258	1.170	.4639E 02	38.088
6.5	12491	.9209E-04	.5638E-03	.1785E 00	.2606E-02	.3798E 03	.1129E 00	.2841E 01	1.000	.3027	.1024	.5179E 02	.9764E 01	.4522E 01	.8771E 01	1.173	.5043E-02	.5762E-02	.8142	1.175	.5477E 02	38.574
7.0	12602	.5359E-04	.3770E-03	.1555E 00	.1774E-02	.5630E 03	.9709E-01	.1016E 01	1.000	.2981	.0997	.6059E 02	.1003E 02	.5132E 01	.1021E 02	1.178	.3428E-02	.3951E-02	.8042	1.179	.6397E 02	39.029
7.5	12692	.3243E-04	.2603E-03	.1361E 00	.1422E-02	.8097E 02	.8425E-01	.1333E 01	1.000	.2944	.0976	.7012E 02	.1025E 02	.5791E 01	.1177E 02	1.181	.2399E-02	.2786E-02	.7954	1.183	.7397E 02	39.451
8.0	12764	.2035E-04	.1851E-03	.1201E 00	.4935E-03	.1132E 04	.7378E-01	.9532E 00	1.000	.2912	.0958	.8039E 02	.1044E 02	.6500E 01	.1344E 02	1.185	.1724E-02	.2016E-02	.7878	1.186	.8471E 02	39.842
8.5	12823	.1321E-04	.1352E-03	.1056E 00	.6586E-03	.1543E 04	.6517E-01	.6959E 00	1.000	.2888	.0944	.9129E 02	.1060E 02	.7253E 01	.1521E 02	1.188	.1270E-02	.1494E-02	.7811	1.189	.9614E 02	40.204
9.0	12872	.8838E-05	.1012E-03	.9548E-01	.4964E-03	.2054E 04	.5805E-01	.5252E 00	1.000	.2866	.0931	.1028E 03	.1074E 02	.8048E 01	.1708E 02	1.190	.9568E-03	.1132E-02	.7754	1.191	.1083E 03	40.541
9.5	12913	.6070E-05	.7718E-04	.8594E-01	.3812E-03	.2684E 04	.5207E-01	.4020E 00	1.000	.2847	.0921	.1150E 03	.1086E 02	.8884E 01	.1905E 02	1.193	.7342E-03	.8726E-03	.7703	1.194	.1210E 03	40.857
10.0	12947	.4265E-06	.5952E-04	.7778E-01	.2975E-03	.3449E-05	.3129E 00	.4999E-01	1.000	.2832	.0913	.1096E 03	.9759E 01	.2111E 02	.1195	.5723E-03	.6631E-03	.7659	1.195	.1342E 03	41.154	
10.5	12977	.3057E-05	.4721E-04	.7077E-01	.2355E-03	.4367E 04	.4266E-01	.2471E 00	1.000	.2816	.0905	.1410E 03	.1105E 02	.1067E 02	.2326E 02	1.196	.4530E-03	.5427E-03	.7619	1.197	.1482E 03	41.434
11.0	13002	.2227E-05	.3764E-04	.1885E-01	.5466E-04	.3898E-01	.1974E 00	.2799	1.000	.2799	.0899	.1551E 03	.1144E 02	.1162E 02	.2551E 02	1.198	.3630E-03	.4363E-03	.7584	1.199	.1630E 03	41.700
11.5	13024	.1647E-05	.3034E-04	.5934E-01	.1525E-03	.6769E 04	.3561E-01	.1594E 00	1.000	.2787	.0892	.1696E 03	.1122E 02	.1261E 02	.2786E 02	1.199	.2937E-03	.3541E-03	.7553	1.200	.1782E 03	41.954
12.0	13044	.1234E-05	.2469E-04	.5464E-01	.1244E-03	.8306E 04	.3272E-01	.1299E 00	1.000	.2778	.0887	.1846E 03	.1128E 02	.1364E 02	.3032E 02	1.200	.2395E-03	.2897E-03	.7524	1.201	.1940E 03	42.199
12.5	13061	.9360E-06	.2026E-04	.5049E-01	.1024E-03	.1011E 05	.3017E-01	.1067E 00	1.000	.2770	.0882	.2003E 03	.1133E 02	.1471E 02	.3289E 02	1.201	.1969E-03	.2387E-03	.7498	1.202	.2103E 03	42.434
13.0	13076	.7165E-06	.1674E-04	.4677E-01	.8479E-04	.1222E 05	.2789E-01	.8829E-01	1.000	.2760	.0878	.2169E 03	.1139E 02	.1583E 02	.3595E 02	1.202	.1630E-03	.1981E-03	.7473	1.203	.2275E 03	42.662
13.5	13090	.5543E-06	.1394E-04	.4346E-01	.7074E-04	.1466E 05	.2586E-01	.7359E-01	1.000	.2754	.0874	.2338E 03	.1144E 02	.1699E 02	.3839E 02	1.203	.1398E-03	.1655E-03	.7451	1.204	.2451E 03	42.881
14.0	13102	.4329E-06	.1168E-04	.4050E-01	.5940E-04	.1748E 05	.2403E-01	.6179E-01	1.000	.2746	.0870	.2515E 03	.1149E 02	.1818E 02	.4130E 02	1.204	.1141E-03	.1393E-03	.7431	1.205	.2637E 03	43.091
14.5	13113	.3406E-06	.9843E-05	.3781E-01	.5013E-04	.2073E 05	.2238E-01	.5206E-01	1.000	.2741	.0867	.2697E 03	.1153E 02	.1942E 02	.4434E 02	1.205	.9635E-04	.1178E-03	.7412	1.206	.2829E 03	43.295
15.0	13123	.2700E-06	.8338E-05	.3538E-01	.4254E-04	.2445E 05	.2089E-01	.4414E-01	1.000	.2737	.0865	.2898E 03	.1157E 02	.2070E 02	.4751E 02	1.206	.8179E-04	.1002E-03	.7394	1.207	.3030E 03	43.493
15.5	13132	.2157E-06	.7104E-05	.3318E-01	.3629E-04	.2867E 05	.1954E-01	.3763E-01	1.000	.2732	.0861	.3083E 03	.1161E 02	.2202E 02	.5078E 02	1.206	.6985E-04	.8574E-04	.7377	1.207	.3238E 03	43.683
16.0	13141	.1736E-06	.6083E-05	.3118E-01	.3347E 05	.1831E-01	.3224E-01	1.000	.2728	.0858	.3287E 03	.1165E 02	.2338E 02	.5418E 02	1.207	.5959E-04	.7371E-04	.7361	1.207	.3454E 03	43.867	
16.5	13148	.1405E-06	.5231E-05	.2936E-01	.2679E-04	.3889E 05	.1719E-01	.2774E-01	1.000	.2727	.0856	.3494E 03	.1168E 02	.2478E 02	.5772E 02	1.207	.5162E-04	.6357E-04	.7346	1.208	.3673E 03	44.048
17.0	13155	.1144E-06	.4518E-05	.2768E-01	.2316E-04	.4501E 05	.1616E-01	.2397E-01	1.000	.2725	.0854	.3709E 03	.1171E 02	.2623E 02	.6139E 02	1.208	.4462E-04	.5504E-04	.7331	1.208	.3899E 03	44.224
17.5	13161	.9374E-07	.3918E-05	.2615E-01	.2010E-04	.5187E 05	.1522E-01	.2080E-01	1.000	.2723	.0852	.3939E 03	.1174E 02	.2772E 02	.6520E 02	1.208	.3873E-04	.4785E-04	.7317	1.209	.4132E 03	44.395
18.0	13167	.7722E-07	.3411E-05	.2474E-01	.1752E-04	.5955E 05	.1435E-01	.1812E-01	1.000	.2721	.0850	.4161E 03	.1177E 02	.2925E 02	.6914E 02	1.209	.3375E-04	.4176E-04	.7304	1.209	.4371E 03	44.561
18.5	13172	.6394E-07	.2981E-05	.2344E-01	.1532E-04	.6812E 05	.1356E-01	.1584E-01	1.000	.2721	.0848	.4393E 03	.1179E 02	.3082E 02	.7322E 02	1.209	.2948E-04	.3653E-04	.7291	1.210	.4611E 03	44.725
19.0	13177	.5319E-07	.2614E-05	.2224E-01	.1345E-04	.7765E 05	.1282E-01	.1389E-01	1.000	.2719	.0846	.4436E 03	.1181E 02	.3244E 02	.7744E 02	1.210	.2586E-04	.3208E-04	.7278	1.210	.4861E 03	44.884
19.5	13182	.4446E-07	.2300E-05	.2112E-01	.1184E-04	.8822E 05	.1214E-01	.1223E-01	1.000	.2719	.0845	.4483E 03	.1182E 02	.3410E 02	.8181E 02	1.210	.2274E-04	.2826E-04	.7266	1.211	.5114E 03	45.039
20.0	13186	.3733E-07	.2030E-05	.2090E-01	.1046E-04	.9993E 05	.1150E-01	.1080E-01	1.000	.2717	.0843	.5139E 03	.1186E 02	.3580E 02	.8632E 02	1.210	.2008E-04	.2498E-04	.7254	1.211	.5379E 03	45.190

ALITUDE OF 232,700 FLEET SIMULATED AT MACH 13.55

Table I continued

$T_t = 5000^\circ\text{K}$ $P_t = 200 \text{ atmospheres}$ $\rho_t = 10.19 \text{ atmospheres}$ $H_t = 84.25 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.072$ $S/R_t = 31.573$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_1	S/R_2
0.9992	4250	.5633E 00	.6234E 00	.9148E 00	.3400E 00	.1000E 01	.8928E 00	.2179E 04	1.059													
2.0	7498	.1341E 00	.1884E 00	.7412E 00	.3199E 00	.1875E 01	.6663E 00	.1162E 04	1.029	.5412	.3172	.4257E 01	.3153E 01	.1294E 01	.1450E 01	1.074	.6799E 00	.6857E 00	.9857	1.078	.5070E 01	31.988
2.5	8722	.5421E 01	.8822E 01	.6490E 00	.2027E 00	.3443E 01	.5485E 00	.6328E 00	1.015	.4599	.2312	.6747E 01	.4325E 01	.1462E 01	.1779E 01	1.083	.4152E 00	.4235E 00	.9572	1.086	.7658E 01	32.522
3.0	9713	.2050E 01	.3934E 01	.5597E 00	.1121E 00	.6933E 01	.4401E 00	.3143E 03	1.005	.4084	.1835	.9927E 01	.5450E 01	.1674E 01	.2230E 01	1.094	.2250E 00	.2329E 00	.9441	1.097	.1097E 02	33.191
3.5	10482	.7665E 02	.1770E 01	.4636E 00	.5874E 01	.1428E 00	.3479E 00	.1526E 03	1.001	.3753	.1550	.1395E 02	.6452E 01	.1958E 01	.2829E 01	1.105	.1164E 00	.1225E 00	.9192	1.108	.1519E 02	33.917
4.0	11026	.5134E 02	.8732E 00	.3206E 01	.2752E 02	.2784E 00	.7918E 02	1.000	.3544	.1380	.1863E 02	.7248E 01	.2305E 01	.3542E 01	1.115	.6294E 01	.6735E 01	.8954	1.118	.2008E 02	34.601	
4.5	11416	.1404E 02	.4683E 02	.3214E 00	.1843E 01	.4955E 02	.2266E 00	.4297E 02	1.000	.3396	.1269	.2391E 02	.7678E 01	.2699E 01	.4259E 01	1.125	.3599E 01	.3908E 01	.8762	1.127	.2563E 02	35.229
5.0	11709	.6676E 03	.2651E 02	.2699E 00	.1098E 01	.8524E 02	.1863E 00	.2555E 02	1.000	.3291	.1190	.2997E 02	.8444E 01	.3308E 01	.2135E 01	1.133	.2135E 01	.3577	1.135	.3198E 02	35.819	
5.5	11925	.3446E 03	.1605E 02	.2301E 00	.6883E 02	.1384E 03	.1561E 00	.1574E 02	1.000	.3213	.1133	.3647E 02	.8825E 01	.3625E 01	.1337E 01	1.140	.1491E 01	.8418	1.142	.3879E 02	36.352	
6.0	12095	.1892E 03	.1005E 02	.1975E 00	.4442E 02	.2178E 03	.1318E 00	.1000E 02	1.000	.3148	.1069	.4373E 02	.9187E 01	.4193E 01	.7511E 01	1.146	.8598E 02	.9705E 02	.8273	1.148	.4641E 02	36.857
6.5	12230	.1038E 03	.6520E 03	.1706E 00	.2945E 02	.3322E 03	.1122E 00	.6558E 01	1.000	.3094	.1053	.5177E 02	.9497E 01	.4732E 01	.6822E 01	1.152	.5691E 02	.6495E 02	.8141	1.154	.9484E 02	37.347
7.0	12338	.6083E 04	.4378E 03	.1485E 00	.2012E 02	.4905E 03	.9654E 01	.4442E 01	1.000	.3049	.1024	.6557E 02	.9765E 01	.5360E 01	.1026E 02	1.157	.3884E 02	.4478E 02	.8024	1.159	.6406E 02	37.774
7.5	12424	.3684E 04	.3035E 03	.1301E 00	.1415E 02	.7027E 03	.8383E 01	.3101E 01	1.000	.3011	.1000	.7613E 02	.9998E 01	.6038E 01	.1182E 02	1.162	.2728E 02	.3174E 02	.7920	1.163	.7407E 02	38.184
8.0	12495	.2319E 04	.2165E 03	.1148E 00	.1021E 02	.9795E 03	.7344E 01	.2224E 01	1.000	.2981	.0981	.8188E 02	.1120E 02	.6762E 01	.1349E 02	1.166	.1966E 02	.2307E 02	.7827	1.167	.8481E 02	38.565
8.5	12552	.1511E 04	.1587E 03	.1021E 00	.7551E 03	.1330E 04	.6494E 01	.1638E 01	1.000	.2955	.0964	.9427E 02	.1037E 02	.7528E 01	.1526E 02	1.169	.1454E 02	.1719E 02	.7744	1.171	.9621E 02	38.918
9.0	12599	.1191E 04	.5706E 03	.1766E 00	.5788E 01	.1233E 00	.1233E 00	.2930	0.950	.1028E 02	.8332E 01	.1713E 02	1.175	.1098E 02	.1307E 02	.7670	1.174	.1083E 03	39.247			
9.5	12639	.6983E 05	.9103E 04	.8223E 01	.4391E 03	.2303E 04	.5194E 01	.9462E 00	1.000	.2908	.0938	.1149E 03	.1066E 02	.9175E 01	.1909E 02	1.175	.8448E 03	.1012E 02	.7604	1.177	.1210E 03	39.555
10.0	12672	.4918E 05	.7080E 04	.7446E 01	.3434E 03	.2953E 04	.4691E 01	.7379E 00	1.000	.2887	.0928	.1277E 03	.1078E 02	.1005E 02	.2114E 02	1.178	.6605E 02	.7544	1.179	.1349E 03	39.843	
10.5	12701	.3529E 05	.5584E 04	.5776E 01	.2720E 03	.3736E 04	.4259E 01	.5832E 00	1.000	.2870	.0919	.1449E 03	.1086E 02	.1097E 02	.2329E 02	1.180	.5228E 02	.6332E 03	.7490	1.182	.1481E 03	40.122
11.0	12726	.2575E 05	.4457E 04	.6193E 01	.2179E 03	.4388E 01	.4664E 00	.1000E 00	1.000	.2852	.0902	.1549E 03	.1099E 02	.1192E 02	.2554E 02	1.183	.4190E 03	.7440	1.184	.1628E 03	40.438	
11.5	12748	.1905E 05	.3594E 04	.5683E 01	.1764E 03	.5783E 04	.3557E 01	.3768E 00	1.000	.2837	.0902	.1694E 03	.1115E 02	.1219E 02	.2799E 02	1.185	.3392E 03	.4147E 03	.7394	1.186	.1780E 03	40.634
12.0	12767	.1429E 05	.2926E 04	.5234E 01	.1440E 03	.7093E 04	.3269E 01	.3072E 00	1.000	.2824	.0896	.1845E 03	.1116E 02	.1393E 02	.3035E 02	1.187	.2769E 03	.3400E 03	.7352	1.188	.1938E 03	40.875
12.5	12783	.1083E 05	.2400E 04	.4835E 01	.1184E 03	.8534E 04	.3013E 01	.2523E 00	1.000	.2812	.0890	.2002E 03	.1124E 02	.1500E 02	.2150E 02	1.188	.2277E 03	.2807E 03	.7312	1.189	.2103E 03	41.107
13.0	12798	.8292E 06	.1984E 04	.4480E 01	.9813E 04	.1043E 05	.2785E 01	.2088E 00	1.000	.2800	.0884	.2167E 03	.1124E 02	.1611E 02	.2564E 02	1.190	.1886E 03	.2333E 03	.7276	1.191	.2274E 03	41.332
13.5	12812	.6418E 06	.1652E 04	.4164E 01	.8189E 04	.1252E 05	.2582E 01	.1741E 00	1.000	.2757	.0579	.2398E 03	.1138E 02	.1725E 02	.3843E 02	1.191	.1574E 03	.1954E 03	.7243	1.192	.2453E 03	41.547
14.0	12824	.5010E 04	.1384E 04	.3879E 01	.6875E 04	.1492E 05	.2400E 01	.1466E 00	1.000	.2777	.0874	.2514E 03	.1144E 02	.1843E 02	.4136E 02	1.193	.1322E 03	.1846E 03	.7212	1.194	.2628E 03	41.755
14.5	12835	.3940E 06	.1166E 04	.3622E 01	.5801E 04	.1770E 05	.2235E 01	.1231E 00	1.000	.2768	.0871	.2697E 03	.1149E 02	.1966E 02	.4441E 02	1.194	.1115E 03	.1393E 03	.7183	1.195	.2830E 03	41.958
15.0	12844	.3125E 06	.9883E 05	.3389E 01	.4924E 04	.2087E 05	.2086E 01	.1044E 00	1.000	.2764	.0865	.2888E 03	.1155E 02	.2093E 02	.4758E 02	1.195	.0472E 03	.1184E 03	.7156	1.196	.3031E 03	42.153
15.5	12853	.2497E 06	.8421E 05	.3179E 01	.4201E 04	.2448E 05	.1951E 01	.8902E 00	1.000	.2749	.0863	.3083E 03	.1150E 02	.2224E 02	.5087E 02	1.196	.8078E 04	.1014E 03	.7132	1.197	.3235E 03	42.343
16.0	12861	.2096E 06	.7210E 05	.2987E 01	.3601E 04	.2857E 05	.1828E 01	.1726E 00	1.000	.2740	.0859	.3286E 03	.1164E 02	.2359E 02	.5430E 02	1.197	.6924E 04	.8715E 04	.7109	1.198	.3446E 03	42.528
16.5	12869	.1626E 06	.6200E 05	.2812E 01	.3101E 04	.1715E 01	.6561E 01	.1167E 00	1.000	.2733	.0857	.3494E 03	.1167E 02	.2498E 02	.5787E 02	1.198	.5956E 04	.7514E 04	.7087	1.199	.3662E 03	42.709
17.0	12875	.1324E 06	.5354E 05	.2652E 01	.2680E 04	.3843E 05	.1613E 01	.1000	.2725	.0853	.3711E 03	.1172E 02	.2642E 02	.6156E 02	1.199	.5148E 04	.6509E 04	.7067	1.200	.3887E 03	42.883	
17.5	12882	.1085E 06	.4644E 05	.2505E 01	.2327E 04	.4429E 05	.1518E 01	.4919E 01	1.000	.2718	.0851	.3933E 03	.1175E 02	.2790E 02	.6539E 02	1.200	.4468E 04	.5660E 04	.7049	1.201	.4118E 03	43.054
18.0	12887	.8939E 07	.4044E 05	.2370E 01	.2028E 04	.5084E 05	.1432E 01	.4286E 01	1.000	.2711	.0848	.4161E 03	.1179E 02	.2941E 02	.6934E 02	1.200	.3895E 04	.4944E 04	.7032	1.201	.4357E 03	43.218
18.5	12892	.7402E 07	.3534E 05	.2245E 01	.1774E 04	.5815E 05	.1352E 01	.3747E 01	1.000	.2706	.0846	.4395E 03	.1182E 02	.3096E 02	.7343E 02	1.201	.3408E 04	.4333E 04	.7016	1.202	.4604E 03	43.379
19.0	12897	.6156E 07	.3098E 05	.2130E 01	.1556E 04	.6631E 05	.1278E 01	.3268E 01	1.000	.2699	.0844	.4638E 03	.1185E 02	.3256E 02	.7767E 02	1.202	.2993E 04	.3811E 04	.7001	1.202	.4862E 03	43.535
19.5	12902	.5145E 07	.2726E 05	.2024E 01	.1370E 04	.7534E 05	.1210E 01	.2892E 01	1.000	.2694	.0842	.4886E 03	.1188E 02	.3420E 02	.8204E 02	1.202	.2637E 04	.3363E 04	.6987	1.203	.5124E 03	43.688

ALTITUDE OF 194,400 FEET SIMULATED AT MACH 12.03

Table I continued

$T_t = 5000^{\circ}\text{K}$ $p_t = 500 \text{ atmospheres}$ $\rho_t = 26.02 \text{ atmospheres}$ $H_t = 80.23 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.049$ $S/R_t = 30.342$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9989	4207	.5626E 00	.6234E 00	.9116E 00	.3405E 00	.1000E 01	.8897E 00	.5510E 04	1.039													
2.0	7421	.1330E 00	.1886E 00	.7276E 00	.3205E 00	.1874E 01	.6568E 00	.2941E 04	1.017	.5481	.3185	.4285E 01	.3140E 01	.1320E 01	.1470E 01	1.051	.6795E 00	.6245E 00	.9878	1.055	.5110E 01	30.748
2.5	8612	.5933E-01	.8936E-01	.6288E 00	.2945E 00	.3408E 01	.5377E 00	.1617E 04	1.007	.4632	.2339	.6808E 01	.4275E 01	.1815E 01	.1813E 01	1.059	.4176E 00	.4247E 00	.9717	1.062	.7742E 01	31.263
3.0	9561	.2067E-01	.4680E-01	.5305E 00	.1151E 00	.6724E 01	.4303E 00	.8193E 03	1.002	.4138	.1873	.1005E 02	.5338E 01	.1765E 01	.2278E 01	1.068	.2302E 00	.2371E 00	.9512	1.071	.1114E 02	31.889
3.5	10269	.8095E-02	.1927E-01	.4406E 00	.6271E-01	.1325E 02	.3427E 00	.4157E 03	1.000	.3829	.1602	.1404E 02	.6242E 01	.2082E 01	.2868E 01	1.078	.1238E 00	.1294E 00	.9293	1.081	.1530E 02	32.565
4.0	10780	.3415E-02	.9794E-02	.3659E 00	.3511E-01	.2484E 02	.2758E 00	.2216E 03	1.000	.3626	.1434	.6973E 01	.2454E 01	.3572E 01	1.088	.6877E-01	.7290E-01	.9082	1.090	.2014E 02	33.203	
4.5	11155	.1543E-02	.5300E-02	.3054E 00	.2034E-01	.4437E 02	.2246E 00	.1242E 03	1.000	.3482	.1321	.2389E 02	.7568E 01	.2879E 01	.4393E 01	1.097	.3962E 01	.4259E 01	.8884	1.099	.2568E 02	33.807
5.0	11432	.7487E-03	.3053E-02	.2573E 00	.1231E-01	.7514E 02	.1855E 00	.7332E 02	1.000	.3379	.1242	.2981E 02	.8054E 01	.3391E 01	.5324E 01	1.105	.2389E 01	.2603E 01	.8704	1.107	.3191E 02	34.365
5.5	11644	.3852E-03	.1846E-02	.2189E 00	.7721E-02	.1220E 03	.1551E 00	.4515E 02	1.000	.3299	.1182	.3635E 02	.8460E 01	.3865E 01	.6373E 01	1.112	.1494E 01	.1648E 01	.8538	1.114	.3878E 02	34.886
6.0	11809	.2075E-02	.1160E-02	.1878E 00	.4989E-02	.1915E 03	.1309E 00	.2877E 02	1.000	.3234	.1138	.4361E 02	.8806E 01	.4424E 01	.7554E 01	1.118	.9633E 02	.1076E 01	.8387	1.120	.4641E 02	35.377
6.5	11940	.1186E-02	.7543E-03	.1621E 00	.3318E-02	.2912E 03	.1119E 00	.1892E 02	1.000	.3180	.1098	.5166E 02	.9105E 01	.5045E 01	.8873E 01	1.125	.6396E 02	.7224E-02	.8248	1.126	.5488E 02	35.837
7.0	12044	.6833E-04	.5083E-03	.1410E 00	.2275E-02	.4284E 03	.9592E-01	.1286E 02	1.000	.3135	.1067	.6048E 02	.3336E 01	.5713E 01	.1032E 02	1.130	.4382E 02	.5001E 02	.8122	1.132	.6413E 02	36.264
7.5	12128	.4170E-04	.3540E-03	.1236E 00	.1606E-02	.6111E 03	.8335E-01	.9017E 01	1.000	.3098	.1042	.7000E 02	.9594E 01	.6429E 01	.1188E 02	1.139	.3091E 02	.3562E 02	.8008	1.137	.7413E 02	36.660
8.0	12195	.2637E-04	.2536E-03	.1091E 00	.1163E-02	.8482E 03	.7310E-01	.6495E 01	1.000	.3067	.1021	.8235E 02	.9791E 01	.7181E 01	.1355E 02	1.139	.2237E 02	.2602E 02	.7905	1.141	.8486E 02	37.027
8.5	12251	.1726E-04	.1866E-03	.9702E-01	.8640E-03	.1147E 04	.6470E-01	.4802E 01	1.000	.3040	.1003	.9188E 02	.9966E 01	.7992E 01	.1591E 02	1.143	.1661E 02	.1948E 02	.7812	1.145	.9624E 02	37.368
9.0	12296	.1182E-04	.1404E-03	.8686E-01	.6549E-03	.1519E 04	.5770E-01	.3626E 01	1.000	.3017	.0988	.1025E 03	.1012E 02	.8832E 01	.1717E 02	1.147	.1258E-02	.1486E-02	.7728	1.149	.1082E 03	37.687
9.5	12335	.8033E-05	.1076E-03	.7823E-01	.5051E-03	.1976E 04	.5182E-01	.2788E 01	1.000	.2995	.0975	.1446E 03	.1028E 02	.9709E 01	.1912E 02	1.150	.9699E-03	.1154E-03	.7650	1.152	.1320E 03	37.986
10.0	12367	.5663E-05	.8985E-04	.7086E-01	.3956E-03	.3630E 04	.4683E-01	.2178E 01	1.000	.2974	.0962	.1273E 03	.1039E 02	.1062E 02	.2117E 02	1.154	.7575E-03	.9104E-03	.7579	1.155	.1342E 03	38.268
11.5	12495	.4069E-05	.6619E-04	.6450E-01	.3137E-03	.3197E 04	.4252E-01	.1723E 01	1.000	.2956	.0952	.1405E 03	.1050E 02	.1157E 02	.2391E 02	1.158	.6021E 03	.7262E 03	.7513	1.158	.1448E 03	38.537
12.0	12449	.2200E-05	.4266E-04	.5412E-01	.2037E-03	.4943E 04	.3552E-01	.1119E 01	1.000	.2934	.0933	.1688E 03	.1017E 02	.1357E 02	.2792E 02	1.162	.3909E-03	.4770E-03	.7393	1.163	.1777E 03	39.038
12.5	12459	.1650E-05	.3473E-04	.4984E-01	.1663E-03	.6062E 04	.3264E-01	.9089E 00	1.000	.2911	.0925	.1829E 03	.1081E 02	.1462E 02	.3038E 02	1.164	.3192E-03	.3916E-03	.7339	1.165	.1935E 03	39.274
13.0	12475	.1250E-05	.2849E-04	.4664E-01	.1366E-03	.7380E 04	.3008E-01	.7466E 00	1.000	.2899	.0918	.1997E 03	.1088E 02	.1572E 02	.3297E 02	1.166	.2625E-03	.3237E-03	.7288	1.168	.2100E 03	39.502
13.5	12503	.7417E-06	.1962E-04	.3966E-01	.9464E-04	.1065E 05	.2578E-01	.5154E 00	1.000	.2874	.0904	.2331E 03	.1106E 02	.1601E 02	.3216E 02	1.170	.2696E-03	.2739	1.170	.2270E 03	39.721	
14.0	12515	.5786E-06	.1643E-04	.3694E-01	.7941E-04	.1275E 05	.2395E-01	.4320E 00	1.000	.2863	.0899	.2307E 03	.1112E 02	.1922E 02	.4142E 02	1.172	.1524E-03	.1906E-03	.7151	1.173	.2364E 03	40.138
14.5	12525	.4455E-06	.1349E-01	.6703E-04	.1512E 05	.2230E-01	.3643E 00	1.000	.2852	.0893	.2591E 03	.1120E 02	.2047E 02	.4449E 02	1.174	.1286E-03	.1615E-03	.7110	1.175	.2825E 03	40.338	
15.0	12535	.3612E-06	.1174E-04	.3228E-01	.5690E-04	.1783E 05	.2082E-01	.3091E 00	1.000	.2841	.0887	.2881E 03	.1127E 02	.2175E 02	.4767E 02	1.175	.1092E-03	.1377E-03	.7071	1.177	.3024E 03	40.530
15.5	12543	.2886E-06	.9000E-05	.3028E-01	.4485E-04	.2091E 05	.1947E-01	.2635E 00	1.000	.2821	.0883	.3077E 03	.1133E 02	.2307E 02	.5098E 02	1.177	.9318E-04	.1179E 03	.7035	1.178	.3229E 03	40.717
16.0	12551	.2321E-06	.8561E-05	.2845E-01	.4416E-04	.2441E 05	.1823E-01	.2257E 00	1.000	.2821	.0878	.3284E 03	.1139E 02	.2443E 02	.5442E 02	1.178	.7990E-04	.1015E-03	.7000	1.180	.3442E 03	40.899
16.5	12558	.1879E-06	.7361E-05	.2678E-01	.3582E-04	.2837E 05	.1711E-01	.1942E 00	1.000	.2812	.0873	.3498E 03	.1145E 02	.2583E 02	.5800E 02	1.180	.6879E-04	.8771E-04	.6967	1.181	.3361E 03	41.075
17.0	12565	.1530E-06	.6359E-05	.2525E-01	.3209E-05	.1608E-01	.1678E 00	1.000	.2803	.0869	.3705E 03	.1150E 02	.2727E 02	.6171E 02	1.181	.5949E-04	.7611E-04	.6936	1.183	.3887E 03	41.247	
17.5	12571	.1254E-06	.5515E-05	.2366E-01	.2689E-04	.3784E 05	.1514E-01	.1456E 00	1.000	.2795	.0866	.3926E 03	.1155E 02	.2874E 02	.6555E 02	1.182	.5163E-04	.6627E-04	.6906	1.184	.4118E 03	41.415
18.0	12576	.1033E-06	.4802E-05	.2257E-01	.4234E-04	.4344E 05	.1428E-01	.1268E 00	1.000	.2788	.0862	.4154E 03	.1160E 02	.3025E 02	.6954E 02	1.184	.4497E-04	.5790E-04	.6877	1.185	.4355E 03	41.578
18.5	12582	.8551E-07	.4196E-05	.2138E-01	.2049E-04	.4968E 05	.1348E-01	.1109E 00	1.000	.2780	.0858	.4398E 03	.1165E 02	.3181E 02	.7366E 02	1.185	.3934E-04	.5081E-04	.6850	1.186	.4601E 03	41.736
19.0	12586	.7115E-07	.3680E-05	.2029E-01	.1799E-04	.3663E 05	.1274E-01	.9729E-01	1.000	.2772	.0855	.4632E 03	.1169E 02	.3340E 02	.7793E 02	1.186	.3453E-04	.4473E-04	.6824	1.187	.4854E 03	41.891

ALTITUDE OF 153,600 FEET SIMULATED AT MACH 11.26

Table I continued

$T_t = 5000^{\circ}\text{K}$ $P_t = 1000 \text{ atmospheres}$ $\rho_t = 52.70 \text{ atmospheres}$ $H_t = 77.91 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.036$ $S/R_t = 29.469$

M	U	P/P_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_{t1}	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9998	4187	.5615E 00	.6232E 00	.9086E 00	.3413E 00	.1000E 01	.8875E 00	.1100E 05	1.028													
2.0	7368	.1326E 00	.1896E 00	.7172E 00	.3216E 00	.1867E 01	.6516E 00	.5944E 04	1.010	.5449	.3204	.4296E 01	.3121E 01	.1340E 01	.1480E 01	.1038	.6805E 00	.6846E 00	.9896	.1.041	.5131E 01	29.868
2.5	8536	.3595E-01	.9057E-01	.6147E 00	.2063E 00	.3374E 01	.5321E 00	.3290E 04	1.004	.4665	.2365	.6838E 01	.4229E 01	.1554E 01	.1830E 01	1.045	.4204E 00	.4264E 00	.9758	.1.047	.7725E 01	30.371
3.0	9455	.2100E-01	.4215E-01	.5156E 00	.1177E 00	.6546E 01	.4262E 00	.1696E 04	1.001	.4182	.1908	.1007E 02	.5241E 01	.1828E 01	.2297E 01	1.053	.2350E 00	.2409E 00	.9580	.1.055	.1119E 01	30.982
3.5	10137	.8380E-02	.2030E-01	.4276E 00	.6519E-01	.1268E 02	.3404E 00	.8756E 03	1.000	.3879	.1640	.1400E 02	.6096E 01	.2164E 01	.2885E 01	1.061	.1285E 00	.1334E 00	.9384	.1.064	.1533E 02	31.622
4.0	10633	.3573E-02	.1042E-01	.3551E 00	.3682E-01	.2334E 02	.2744E 00	.4716E 03	1.000	.3682	.1473	.1857E 02	.6788E 01	.2557E 01	.3587E 01	1.070	.7198E-01	.7570E-01	.9189	.1.072	.2015E 02	32.240
4.5	11001	.1614E-02	.5651E-02	.2960E 00	.2137E-01	.4197E 02	.2232E 00	.2645E 03	1.000	.3540	.1359	.2387E 02	.7358E 01	.3008E 01	.4415E 01	.4425E-01	.9000	.1.080	.2572E 02	32.832		
5.0	11270	.7926E-03	.3288E-02	.2498E 00	.1305E-01	.7042E 02	.1848E 00	.1576E 03	1.000	.3435	.1279	.2970E 02	.7816E 01	.3499E 01	.5338E 01	1.086	.2526E-01	.2725E-01	.8828	.1.088	.3187E 02	33.371
5.5	11476	.4079E-03	.1989E-02	.2124E 00	.8189E-02	.1143E 03	.1544E 00	.9715E 02	1.000	.3356	.1219	.3625E 02	.9207E 01	.4040E 01	.6393E 01	1.093	.1582E-01	.1727E-01	.8665	.1.095	.3877E 02	33.883
6.0	11640	.2202E-03	.1252E-02	.1821E 00	.5302E-02	.1790E 03	.1304E 00	.6202E 02	1.000	.3292	.1171	.4353E 02	.8541E 01	.4633E 01	.7580E 01	1.100	.1022E-01	.1129E-01	.8513	.1.102	.4641E 02	34.362
6.5	11769	.1239E-03	.8166E-03	.1572E 00	.3534E-02	.2715E 03	.1111E 00	.4089E 02	1.000	.3239	.1133	.5157E 02	.8829E 01	.5281E 01	.8902E 01	1.106	.6802E-02	.7596E-02	.8374	.1.108	.5490E 02	34.812
7.0	11871	.7281E-04	.5516E-03	.1367E 00	.2429E-02	.3985E 03	.9557E-01	.2786E 02	1.000	.3195	.1102	.6036E 02	.9078E 01	.5981E 01	.1035E 02	1.112	.4669E-02	.5269E-02	.8246	.1.113	.6413E 02	35.230
7.5	11952	.4452E-04	.3849E-03	.1198E 00	.1718E-02	.5671E 03	.8308E 02	.1957E 01	1.000	.3158	.1076	.6985E 02	.9294E 01	.6731E 01	.1191E 02	1.117	.3300E-02	.3759E-02	.8130	.1.118	.7411E 02	35.618
8.0	12019	.2824E-04	.2766E-03	.1058E 00	.1248E-02	.7850E 03	.7291E-01	.1414E 02	1.000	.3126	.1054	.8006E 02	.9487E 01	.7526E 01	.1357E 02	1.121	.2396E-02	.2755E-02	.8025	.1.123	.8484E 02	35.976
8.5	12073	.1853E-04	.2039E-03	.9412E-01	.9287E-03	.1060E 04	.6456E-01	.1048E 02	1.000	.3099	.1036	.9085E 02	.9655E 01	.8361E 01	.1533E 02	1.125	.1782E-02	.2066E-02	.7929	.1.127	.9618E 02	36.309
9.0	12117	.1250E-04	.1537E-03	.8427E-01	.7050E-03	.1401E 04	.5761E-01	.7922E 01	1.000	.3074	.1019	.1023E 03	.9810E 01	.9236E 01	.1719E 02	1.129	.1352E-02	.1580E-02	.7841	.1.131	.1082E 03	36.620
9.5	12155	.8645E-05	.1180E-03	.7593E-01	.5446E-03	.1820E 04	.5176E-01	.6100E 01	1.000	.3055	.1006	.1143E 02	.9943E 01	.1015E 02	.1514E 02	1.133	.1044E-02	.1225E-02	.7759	.1.134	.1208E 03	36.914
10.0	12187	.6107E-05	.9198E-04	.6879E-01	.4266E-03	.2328E 04	.4678E-01	.4769E 01	1.000	.3036	.0993	.1269E 02	.1007E 01	.1105E 02	.2118E 02	1.136	.8182E-03	.9697E-03	.7684	.1.138	.1340E 03	37.190
10.5	12214	.4392E-05	.7266E-04	.6262E-01	.3387E-03	.2940E 04	.4248E-01	.3776E 01	1.000	.3018	.0982	.1416E 02	.1019L 02	.1207E 02	.2332E 02	1.139	.6492E-03	.7745E-03	.7613	.1.141	.1478E 03	37.454
11.0	12238	.3208E-05	.5805E-04	.5725E-01	.2717E-03	.3672E 04	.3875E-01	.3023E 01	1.000	.3001	.0971	.1539E 02	.1029E 02	.1309E 02	.2557E 02	1.142	.5202E-03	.6250E-03	.7547	.1.144	.1623E 03	37.706
11.5	12259	.2377E-05	.4686E-04	.5220E-01	.4542E 04	.3549E-01	.2200E-03	.2998E 01	1.000	.2986	.0962	.1683E 03	.1039E 02	.1415E 02	.2792E 02	1.145	.4217E-03	.5092E-03	.7485	.1.146	.1774E 03	37.948
12.0	12277	.1782E-05	.3814E-04	.4483E-01	.1796E-03	.5572E 04	.5261E-01	.1992E 01	1.000	.2971	.0953	.1834E 03	.1049E 02	.1524E 02	.3040E 02	1.147	.3443E-03	.4181E-03	.7426	.1.149	.1932E 03	38.181
12.5	12293	.1351E-05	.3130E-04	.4447E-01	.1476E-03	.6781E 04	.3005E-01	.1637E 01	1.000	.2959	.0945	.1919E 03	.1058E 02	.1637E 02	.3298E 02	1.149	.2832E-03	.3459E-03	.7370	.1.151	.2097E 03	38.405
13.0	12308	.1036E-05	.2589E-04	.4144E-01	.1225E-03	.8188E 04	.2779E-01	.1356E 01	1.000	.2946	.0938	.2154E 03	.1066E 02	.1754E 02	.3568E 02	1.152	.2349E-03	.2884E-03	.7317	.1.153	.2268E 03	38.621
13.5	12320	.8012E-06	.2156E-04	.3851E-01	.1022E-03	.9824E 04	.2575E-01	.1130E 01	1.000	.2936	.0931	.2324E 03	.1074E 02	.1875E 02	.3850E 02	1.154	.1959E-03	.2417E-03	.7267	.1.155	.2446E 03	38.830
14.0	12332	.6249E-06	.1805E-04	.3581E-01	.8577E-04	.1172E 05	.2392E-01	.9471E 00	1.000	.2924	.0924	.2501E 03	.1082E 02	.1999E 02	.4145E 02	1.156	.1644E-03	.2039E-03	.7219	.1.158	.2631E 03	39.032
14.5	12342	.4919E-06	.1522E-04	.3349E-01	.7242E-04	.1389E 05	.2228E-01	.7990E 00	1.000	.2914	.0918	.2683E 03	.1089E 02	.2128E 02	.4452E 02	1.158	.1388E-03	.1729E-03	.7173	.1.159	.2821E 03	39.229
15.0	12352	.3903E-06	.1290E-04	.3135E-01	.6148E-04	.1638E 05	.2079E-01	.6778E 00	1.000	.2904	.0912	.2872E 03	.1096E 02	.2260E 02	.4771E 02	1.160	.1178E-03	.1747E-03	.7130	.1.161	.3019L 03	39.419
15.5	12360	.3118E-06	.1099E-04	.2940E-01	.5245E-04	.1921E 05	.1944E-01	.5778E 00	1.000	.2894	.0907	.3068E 03	.1103E 02	.2395E 02	.5103E 02	1.161	.1005E-03	.1263E-03	.7088	.1.163	.3223E 03	39.604
16.0	12368	.2575E-06	.9404E-05	.2762E-01	.4495E-04	.2243E 05	.1821E-01	.5949E 00	1.000	.2883	.0901	.3272E 03	.1109E 02	.2535E 02	.5448E 02	1.163	.8617E-04	.1087E-03	.7049	.1.165	.3436E 03	39.783
16.5	12375	.2030E-06	.8087E-05	.2600E-01	.3870E-04	.2607E 05	.1708E-01	.4258E 00	1.000	.2874	.0897	.3480E 03	.1115E 02	.2679E 02	.5807E 02	1.165	.7420E-04	.9401E-04	.7011	.1.166	.3655E 03	39.957
17.0	12382	.1654E-06	.6986E-05	.2452E-01	.3346E-04	.3016E 05	.1606E-01	.3680E 00	1.000	.2865	.0892	.3696E 03	.1122E 02	.2826E 02	.6179E 02	1.166	.6418E-04	.8644E-04	.6975	.1.168	.3881E 03	40.126
17.5	12388	.1355E-06	.6059E-05	.2316E-01	.2905E-04	.3476E 05	.1512E-01	.3193E 00	1.000	.2857	.0887	.3917E 03	.1127E 02	.2976E 02	.6564E 02	1.168	.5571E-04	.7119E-04	.6940	.1.169	.4113E 03	40.292
18.0	12393	.1116E-06	.5275E-05	.2191E-01	.2531E-04	.3391E 05	.1425E-01	.2849	0.000	.2849	.0883	.4146E 03	.1132E 02	.3131E 02	.5964E 02	1.169	.4855E-04	.6221E-04	.6907	.1.171	.4351E 03	40.453
18.5	12398	.9238E-07	.4610E-05	.2076E-01	.2214E-04	.4565E 05	.1345E-01	.2432E 00	1.000	.2841	.0879	.4380E 03	.1138E 02	.3290E 02	.5737E 02	1.170	.4246E-04	.5460E-04	.6874	.1.172	.4596E 03	40.610

ALTITUDE OF 136,000 FEET SIMULATED AT MACH 11.44

Table I continued

$T_t = 6000^\circ\text{K}$ $P_t = 100 \text{ atmospheres}$ $P_t = 3.92 \text{ atmospheres}$ $H_t = 115.74 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.158$ $S/R_t = 34.207$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9967	4853	.5588E 00	.6234E 00	.9075E 00	.3422E 00	.1000E 01	.8982E 00	.9600E 03	1.143													
2.0	8462	.1351E 00	.1948E 00	.7275E 00	.3251E 00	.1835E 01	.6906E 00	.5231E 03	1.104	.5477	.3259	.4242E 01	.3069E 01	.1315E 01	.1400E 01	1.161	.6880E 00	.5935E 00	.9860	1.165	.5092E 01	34.640
2.5	9781	.5674E-01	.9410E-01	.6472E 00	.2098E 00	.3287E 01	.5867E 00	.2920E 03	1.079	.4673	.2402	.5618E 01	.4163E 01	.1465E 01	.1170	.4290E 00	.4367E 00	.9691	1.173	.7560E 01	35.192	
3.0	10882	.2209E-01	.4220E-01	.5755E 00	.1164E 00	.6589E 01	.4848E 00	.1497E 03	1.053	.4150	.1907	.5530E 01	.5244E 01	.1621E 01	.2040E 01	1.181	.2339E 00	.2411E 00	.9488	1.184	.1058E 02	35.907
3.5	11801	.8164E-02	.1800E-01	.5097E 00	.5841E 01	.1425E 02	.3983E 00	.6739E 02	1.030	.3786	.1593	.1303E 02	.6279E 01	.1794E 01	.2472E 01	1.192	.1160E 00	.1214E 00	.9270	1.194	.1421E 02	36.739
4.0	12572	.2883E-02	.7418E-02	.4444E 00	.3272E-01	.3171E 00	.2959E 02	1.012	.3592	.1378	.1734E 02	.7256E 01	.2013E 01	.3112E 01	1.202	.5390E 01	.5727E-01	.9050	1.204	.1869E 02	37.568	
4.5	13194	.1014E-02	.3117E-02	.3758E 00	.1264E-01	.7359E 02	.2480E 00	.1305E 02	1.003	.3343	.1232	.2284E 02	.8120E 01	.2330E 01	.3087E 01	1.211	.2478E-01	.2676E-01	.8842	1.213	.2443E 02	38.596
5.0	13623	.4129E-03	.1521E-02	.3141E 00	.6579E-02	.1460E 03	.1982E 00	.6576E 01	1.000	.3226	.1140	.2923E 02	.8772E 01	.2738E 01	.4492E 01	1.217	.1284E 01	.1406E-01	.8675	1.219	.3111E 02	39.395
5.5	13912	.1967E-03	.8584E-03	.2663E 00	.3858E-02	.2543E 03	.1638E 00	.3776E 01	1.000	.3148	.1081	.3597E 02	.9249E 01	.3183E 01	.6044E 01	1.222	.7503E-02	.8910E-02	.8542	1.224	.3814E 02	40.051
6.0	14131	.1005E-03	.5116E-03	.2274E 00	.4186E 01	.1373E 03	.2294E 01	.3096	1.000	.1037	.5345E 02	.9641E 01	.3676E 01	.7219E 01	1.228	.4617E-02	.5170E-02	.8423	1.227	.4594E 02	40.647	
6.5	14293	.5599E-03	.3278E-03	.1976E 00	.1560E-02	.6459E 03	.1174E 00	.1486E 01	1.000	.3052	.1005	.5117E 02	.9952E 01	.4183E 01	.8442E 01	1.229	.3023E-02	.3418E-02	.8321	1.231	.5405E 02	41.169
7.0	14426	.3209E-04	.2155E-08	.1724E 00	.1045E-02	.9755E 03	.1010E 00	.9861E 00	1.000	.3020	.0978	.5975E 02	.1023E 02	.4740E 01	.9820E 01	1.232	.2022E-02	.2307E-02	.8225	1.234	.6302E 02	41.664
7.5	14533	.1909E-04	.1459E-08	.1514E 00	.7183E-03	.1426E 04	.4751E-01	.6730E 00	1.000	.2992	.0955	.6906E 02	.1047E 02	.5342E 01	.1133E 01	1.235	.1388E-02	.1598E-02	.8136	1.236	.7774E 02	42.128
8.0	14622	.1172E-04	.1015E-03	.1337E 00	.5057E-03	.2393E 04	.7639E 01	.4709E 00	1.000	.2966	.0926	.7922E 02	.1069E 02	.5991E 01	.1299E 02	1.237	.9767E-03	.1133E-02	.8054	1.239	.6334E 02	42.564
8.5	14694	.7440E-05	.7255E-04	.1187E 00	.3650E-03	.2838E 04	.6721E-01	.2945	1.000	.0920	.9009E 02	.1087E 02	.5688E 01	.1476E 02	1.240	.7046E-03	.8239E-03	.7977	1.241	.9470E 02	42.969	
9.0	14754	.4870E-05	.5317E-04	.1061E 00	.2697E-01	.3857E 04	.5959E-01	.2489E 00	1.000	.2927	.0906	.1017E 03	.1104E 02	.7417E 01	.1656E 02	1.242	.5201E-03	.6126E-03	.7907	1.245	.1068E 03	43.346
9.5	14804	.3277E-05	.3979E-04	.9523E-01	.2032E-03	.5136E 04	.5319E-01	.1869E 00	1.000	.2910	.0893	.1140E 03	.1120E 02	.8193E 01	.1866E 02	1.243	.3919E-03	.4646E-03	.7841	1.245	.1197E 03	43.698
10.0	14846	.2260E-05	.3042E-04	.8801E-01	.1562E-03	.4700E 04	.4748E-01	.1423E 00	1.000	.2895	.0882	.1270E 03	.1132E 02	.9002E 01	.2076E 02	1.245	.3012E-03	.3595E-03	.7781	1.246	.1233E 03	44.026
10.5	14881	.1598E-05	.2367E-04	.7808E-01	.1221E-03	.8590E 04	.4372E-01	.1118E 00	1.000	.2832	.0873	.1406E 03	.1146E 02	.9846E 01	.2295E 02	1.247	.2354E-03	.2827E-03	.7724	1.248	.1474E 03	44.333
11.0	14912	.1150E-05	.1870E-04	.7122E-01	.9689E-04	.1085E 05	.3934E-01	.8847E-01	1.000	.2871	.0864	.1548E 03	.1157E 02	.1072E 02	.2523E 02	1.248	.1867E-03	.2255E-03	.7671	1.249	.1623E 03	44.622
11.5	14938	.6849E-06	.1497E-04	.6525E-01	.7784E 05	.13593E 05	.7095E-01	.1000	.2860	.0856	.1697E 03	.1163E 02	.2761E 02	1.249	.1500E-03	.1821E-03	.7622	1.251	.1777E 03	44.896		
12.0	14961	.6289E-06	.1213E-04	.6003E-01	.6326E-04	.1668E 05	.3301E-01	.5757E-01	1.000	.2951	.0849	.1850E 03	.1178E 02	.1256E 02	.3008E 02	1.250	.1218E-03	.1488E-03	.7841	1.252	.1937E 03	45.156
12.5	14981	.4748E-06	.9918E-05	.5542E-01	.5187E-04	.2026E 05	.3041E 01	.4714E-01	1.000	.2942	.0842	.2011E 03	.1187E 02	.1353E 02	.3265E 02	1.252	.9992E-04	.1226E-04	.7530	1.253	.2105E 03	45.404
13.0	14999	.3426E-06	.8184E-05	.5133E-01	.4290E-04	.2426E 05	.2812E-01	.3839E-01	1.000	.2933	.0836	.2176E 03	.1196E 02	.1453E 02	.3532E 02	1.253	.8263E-04	.1019E-03	.7488	1.254	.2277E 03	45.642
13.5	15015	.2802E-06	.6805E-05	.4768E-04	.3574E-04	.2962E 05	.2607E-01	.3242E-01	1.000	.2925	.0831	.2348E 03	.1204E 02	.1556E 02	.3810E 02	1.254	.6883E-04	.8524E-04	.7447	1.255	.2456E 03	45.872
14.0	15029	.2186E-06	.5698E-05	.4441E-01	.2999E-04	.3534E 05	.2424E-01	.2717E-01	1.000	.2816	.0825	.2527E 03	.1212E 02	.1662E 02	.4099E 02	1.255	.5776E-04	.7184E-04	.7408	1.256	.2643E 03	46.092
14.5	15041	.1719E-06	.4800E-05	.4146E-01	.2530E-04	.4191E 05	.2259E-01	.2291E-01	1.000	.2808	.0820	.2712E 03	.1220E 02	.1771E 02	.4398E 02	1.256	.4784E-04	.6089E-04	.7371	1.257	.2835E 03	46.306
15.0	15053	.1362E-06	.4065E-05	.3879E-01	.2146E-04	.4945E 05	.2109E 01	.1941E-01	1.000	.2802	.0815	.2094E 03	.1227E 02	.1883E 02	.4711E 02	1.257	.4134E-04	.5186E-04	.7335	1.258	.3035E 03	46.513
15.5	15063	.1085E-06	.3463E-05	.3638E-01	.1831E-04	.5801E 05	.1974E-01	.1655E-01	1.000	.2795	.0811	.3101E 03	.1234E 02	.1995E 02	.5033E 02	1.258	.3526E-04	.4444E-04	.7300	1.259	.3240E 03	46.713
16.0	15073	.8757E-07	.2965E-05	.3419E-01	.1570E-04	.6770E 05	.1851E-01	.1418E-01	1.000	.2789	.0806	.3305E 03	.1240E 02	.2117E 02	.5367E 02	1.259	.3022E-04	.3822E-04	.7266	1.260	.3451E 03	46.907
16.5	15081	.7090E-07	.2550E-05	.3219E-01	.1351E-04	.7868E 05	.1739E-01	.1220E-01	1.000	.2782	.0802	.3516E 03	.1247E 02	.5714E 02	.5714E 02	1.259	.2603E-04	.3304E-04	.7234	1.261	.3672E 03	47.095
17.0	15089	.5771E-07	.2202E-05	.3035E-01	.1168E-04	.9108E 05	.1636E-01	.1049E-01	1.000	.2777	.0798	.3734E 03	.1253E 02	.2365E 02	.6074E 02	1.260	.2250E-04	.2866E-04	.7203	1.262	.3898E 03	47.279
17.5	15096	.4728E-07	.1909E-05	.2867E-01	.1014E-04	.1050E 06	.1542E 01	.9146E-01	1.000	.2771	.0794	.3958E 03	.1259E 02	.2493E 02	.6446E 02	1.261	.1954E-04	.2498E-04	.7172	1.262	.4132E 02	47.457
18.0	15103	.3895E-07	.1663E-05	.2712E-01	.8938E-05	.1205E 06	.1455E-01	.7968E-02	1.000	.2767	.0791	.4187E 03	.1264E 02	.2625E 02	.6829E 02	1.262	.1702E-04	.2184E-04	.7143	1.263	.4369E 02	47.631
18.5	15109	.3226E-07	.1453E-05	.2570E-01	.7730E-05	.1377E 06	.1376E-01	.6967E-02	1.000	.2761	.0787	.4425E 03	.1270E 02	.2759E 02	.7225E 02	1.262	.1489E-04	.1917E-04	.7115	1.264	.4616E 02	47.800
19.0	15115	.2684E-07	.1274E-05	.2438E-01	.6784E-05	.1571E 06	.1302E-02	.6112E-02	1.000	.2758	.0784	.4667E 03	.1275E 02	.2897E 02	.7635E 02	1.263	.1306E-04	.1687E-04	.7087	1.264	.4867E 03	47.966
19.5	15120	.2243E-07	.1121E-05	.2316E-01	.5972E-05	.1785E 06	.1234E-01	.5379E-02	1.000	.2752	.0781	.4918E 03	.1281E 02	.3038E 02	.8058E 02	1.264	.1150E-04	.1491E-04	.7060	1.265	.5128E 03	48.127
20.0	15125	.1883E-07	.8959E-06	.2203E-01	.5274E-05	.2022E 06	.1170E-01	.4748E-02	1.000	.2747	.0778	.5175E 03	.1286E 02	.3182E 02	.8494E 02	1.264	.1016E-04	.1321E-04	.7034	1.266	.5397E 03	48.284
20.5	15129	.1588E-07	.8760E-06	.2098E-01	.4672E-05	.2283E 06	.1111E-01	.4205E-02	1.000	.2744	.0775	.5436E 03	.1291E 02	.3329E 02	.8944E 02	1.265	.900E-05	.1174E-04	.7009	1.266	.5669E 03	48.437
21.0	15134	.1344E-07	.7778E-06	.2001E-01	.4151E-05	.2571E 06	.1057E-01	.3735E-02	1.000	.2739	.07											

Table I continued

$T_t = 6000^{\circ}\text{K}$ $p_t = 200 \text{ atmospheres}$ $p_t = 8.02 \text{ atmospheres}$ $H_t = 111.30 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.134$ $S/R_t = 33.173$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9974	4803	5587E 00	.6236E 00	.9072E 00	.3422E 00	.1000E 01	.8963E 00	.1940E 04	1.120													
2.0	8280	1350E 00	1941E 00	7286E 00	3242E 00	.1841E 01	.6845E 00	.1054E 04	1.082	.5460	.3250	.4244E 01	.3077E 01	.1312E 01	.1412E 01	.1138	.6869E 00	.6924E 00	.9853	1.142	.5090E 01	33.600
2.5	9698	5627E 01	9325E 01	.6462E 00	.2086E 00	.3912E 01	.5775E 01	.5857E 03	1.059	.4850	.2391	.6644E 01	.4183E 01	.1464E 01	.1690E 01	1.149	.4265E 00	.4343E 00	.9673	1.152	.7580E 01	34.146
3.0	10788	2184E 01	4184E 01	.5710E 00	.1158E 00	.6636E 01	.4771E 00	.2924E 03	1.037	.4128	.1899	.9590E 01	.5266E 01	.1627E 01	.2056E 01	1.160	.2325E 00	.2399E 00	.9453	1.163	.1065E 02	34.847
3.5	11689	.6094E 02	.1802E 01	.5002E 00	.5856E 01	.1422E 02	.3862E 00	.1304E 03	1.018	.3768	.1589	.1317E 02	.6291E 01	.1817E 01	.2549E 01	1.173	.1163E 00	.1217E 02	.9223	1.175	.1437E 02	35.657
4.0	12434	.2884E 02	.7592E 00	.4284E 00	.2791E 01	.3173E 02	.3055E 00	.6114E 02	1.004	.3511	.1382	.1768E 02	.2074E 01	.3230E 01	.5498E 01	.5844E 01	.8995	1.186	.1906E 02	.36.540		
4.5	12996	.1085E 02	.3431E 02	.3583E 00	.1378E 01	.6718E 02	.2412E 00	.2886E 02	1.001	.3342	.1247	.2323E 02	.8019E 01	.2424E 01	.4097E 01	1.194	.2698E 01	.2909E 01	.8797	1.196	.2487E 02	37.388
5.0	13380	.4731E 03	.1785E 02	.3006E 00	.7602E 02	.1254E 03	.1957E 00	.1547E 02	1.000	.3231	.1184	.2029E 02	.8594E 01	.2847E 01	.5054E 01	1.201	.1482E 01	.1617E 01	.8644	1.203	.3133E 02	38.106
5.5	13653	.2309E 03	.1025E 02	.2554E 00	.4546E 02	.2140E 03	.1625E 00	.9068E 07	1.000	.3156	.1107	.3801E 02	.9034E 01	.6090E 01	.14207	.8827E 02	.9729E 02	.8519	1.208	.3823E 02	38.730	
6.0	13861	.1203E 03	.6236E 03	.2189E 00	.2850E 02	.3455E 03	.1368E 00	.5599E 01	1.000	.3103	.1085	.4331E 02	.9392E 01	.3808E 01	.7237E 01	1.211	.5519E 02	.6140E 02	.8409	1.212	.4586E 02	39.299
6.5	14022	.6665E 04	.3984E 03	.1898E 00	.1863E 02	.5362E 03	.1167E 00	.3618E 00	1.000	.3066	.1032	.5111E 02	.9686E 01	.4344E 01	.6844E 01	.1215	.3605E 02	.4045E 02	.8312	1.216	.5408E 02	39.818
7.0	14151	.3892E 04	.2625E 03	.1656E 00	.1250E 02	.8062E 03	.1004E 00	.2406E 01	1.000	.3035	.1006	.5949E 02	.9543E 01	.4929E 01	.9870E 01	1.218	.2417E 02	.2417E 02	.8224	1.219	.6305E 02	40.304
7.5	14256	.2282E 04	.1781E 03	.1453E 00	.1179E 04	.8699E 03	.1645E 01	.1000	.3011	.0984	.6991E 02	.1016E 02	.5563E 01	.1139E 02	1.221	.1662E 02	.1894E 02	.8143	1.222	.7282E 02	40.761	
8.0	14342	.1406E 04	.1244E 03	.1283E 00	.6083E 03	.1679E 04	.7598E 01	.1158E 01	1.000	.2988	.0865	.7914E 02	.1036E 02	.6245E 01	.1305E 02	1.223	.1173E 02	.1347E 02	.8068	1.225	.8340E 02	41.187
8.5	14412	.8905E 05	.8911E 04	.1139E 00	.4402E 03	.2332E 04	.6687E 01	.8319E 00	1.000	.2968	.0949	.9002E 02	.1059E 02	.8975E 01	.1483E 02	1.225	.9485E 03	.9808E 03	.7958	1.227	.9481E 02	41.585
9.0	14470	.5875E 05	.6548E 04	.1018E 00	.3261E 03	.3181E 01	.5952E 01	.61937E 00	1.000	.2991	.0936	.1016E 03	.1069E 02	.7747E 01	.1672E 02	.1227	.6282E 03	.7309E 03	.7934	1.229	.1065E 03	41.954
9.5	14519	.3962E 05	.4917E 04	.9140E 01	.2465E 03	.4196E 04	.5299E 01	.4624E 00	1.000	.2937	.0924	.1139E 03	.1082E 02	.8562E 01	.1872E 02	1.229	.4746E 03	.5556E 03	.7875	1.231	.1198E 03	42.298
10.0	14560	.2744E 05	.3769E 04	.8258E 01	.1900E 03	.5458E 04	.4767E 01	.3554E 00	1.000	.2925	.0914	.9412E 01	.1094E 02	.9412E 01	.2081E 02	1.231	.3656E 03	.43036E 03	.7819	1.232	.1333E 03	42.619
10.5	14594	.1943E 05	.2939E 04	.7499E 01	.1489E 03	.6983E 04	.4315E 01	.2778E 00	1.000	.2912	.0904	.1404E 03	.1106E 02	.1030E 02	.2300E 02	1.232	.2866E 03	.3393E 03	.7768	1.234	.1475E 03	42.920
11.0	14624	.1403E 05	.2326E 04	.6842E 01	.1183E 03	.3926E 01	.2203E 00	1.000	.2902	.0896	.1515E 03	.1116E 02	.1122E 02	.2528E 02	1.234	.2276E 03	.2707E 03	.7719	1.235	.1622E 03	43.204	
11.5	14649	.1031E 05	.1865E 04	.6271E 01	.9519E 04	.1096E 00	.1770E 00	1.000	.2894	.0888	.1692E 03	.1126E 02	.1217E 02	.2764E 02	1.235	.1831E 03	.2189E 03	.7673	1.236	.1776E 03	43.473	
12.0	14672	.7693E 06	.1512E 04	.5777E 01	.7742E 04	.1350E 05	.3296E 01	.1437E 00	1.000	.2886	.0882	.1844E 03	.1134E 02	.3011E 02	.1872E 02	1.239	.4746E 03	.5556E 03	.7875	1.238	.1935E 03	43.729
12.5	14691	.5813E 06	.1238E 04	.5327E 01	.6353E 05	.1647E 04	.3037E 01	.1178E 00	1.000	.2879	.0875	.2004E 03	.1143E 02	.1417E 02	.2326E 02	1.240	.1222E 03	.1474E 03	.7588	1.240	.2101E 03	43.974
13.0	14709	.4446E 06	.1022E 04	.4935E 01	.5257E 04	.1993E 05	.2808E 01	.9734E 01	1.000	.2870	.0869	.2169E 03	.1151E 02	.1522E 02	.3535E 02	1.243	.1011E 03	.1225E 03	.7548	1.240	.2274E 03	44.208
13.5	14724	.3435E 06	.8705E 04	.4584E 01	.4382E 04	.2394E 01	.2604E 01	.8104E 01	1.000	.2863	.0863	.1234E 03	.1159E 02	.1630E 02	.3812E 02	1.240	.8427E 04	.1026E 03	.7510	1.241	.2454E 03	44.434
14.0	14738	.2680E 06	.7118E 05	.4271E 01	.3707E 04	.2855E 05	.2421E 01	.6779E 01	1.000	.2857	.0858	.2517E 03	.1165E 02	.1741E 02	.4101E 02	1.241	.7069E 04	.8640E 04	.7473	1.242	.2638E 03	44.652
14.5	14750	.2107E 06	.5994E 05	.3987E 01	.3102E 04	.3388E 05	.2256E 01	.5727E 01	1.000	.2851	.0853	.2702E 03	.1172E 02	.1857E 02	.4402E 02	1.242	.5962E 04	.7316E 04	.7438	1.243	.3820E 03	44.864
14.762	.1670E 06	.5078E 05	.3731E 01	.2632E 04	.3396E 05	.2107E 01	.4856E 01	1.000	.2844	.0848	.2893E 03	.1179E 02	.1975E 02	.4714E 02	1.242	.5059E 02	.6232E 04	.7404	1.244	.3029E 03	45.068	
15.5	14772	.1335E 06	.4327E 05	.3499E 01	.2246E 04	.4468E 05	.1972E 01	.4140E 01	1.000	.2837	.0844	.3090E 03	.1185E 02	.2097E 02	.5036E 02	1.243	.4318E 04	.5338E 04	.7371	1.245	.3234E 03	45.265
16.0	14781	.1074E 06	.3705E 05	.3288E 01	.1925E 04	.5469E 05	.1849E 01	.3454E 01	1.000	.2831	.0839	.3293E 03	.1191E 02	.2222E 02	.5371E 02	1.244	.3703E 04	.4595E 04	.7339	1.246	.3447E 03	45.457
16.5	14790	.8692E 07	.3185E 05	.3095E 01	.1657E 04	.6358E 05	.1736E 01	.1209E 01	1.000	.2826	.0835	.3503E 03	.1197E 02	.2351E 02	.5720E 02	1.245	.3187E 04	.3968E 04	.7308	1.246	.3666E 03	45.644
17.0	14797	.7078E 07	.2751E 05	.2918E 01	.1432E 04	.7359E 05	.1633E 01	.1236E 01	1.000	.2821	.0832	.3720E 03	.1203E 02	.2428E 02	.6080E 02	1.246	.2754E 04	.3442E 04	.7278	1.247	.3892E 03	45.825
17.5	14805	.5799E 07	.2386E 05	.2757E 01	.1244E 04	.8480E 05	.1539E 01	.2288E 01	1.000	.2816	.0828	.3943E 03	.1208E 02	.2618E 02	.6452E 02	1.247	.2391E 04	.2999E 04	.7249	1.248	.4123E 03	46.002
18.0	14811	.4778E 07	.2078E 05	.2608E 01	.1084E 04	.9733E 05	.1453E 01	.1993E 01	1.000	.2812	.0824	.4171E 03	.1213E 02	.2757E 02	.6837E 02	1.247	.2084E 04	.2622E 04	.7221	1.249	.4362E 03	46.173
18.5	14817	.3956E 07	.1816E 05	.2471E 01	.9481E 05	.1113E 06	.1373E 01	.1743E 01	1.000	.2807	.0821	.4408E 03	.1218E 02	.2899E 02	.7235E 02	1.248	.1823E 04	.2301E 04	.7193	1.249	.4609E 03	46.340
19.0	14822	.3291E 07	.1592E 05	.2345E 01	.8319E 05	.1269E 06	.1299E 01	.1528E 01	1.000	.2802	.0817	.4652E 03	.1224E 02	.3044E 02	.7646E 02	1.249	.2027E 04	.7167	.1250	.4863E 03	46.503	
19.5	14827	.2751E 07	.1401E 05	.2227E 01	.7324E 05	.1442E 06	.1231E 01	.1345E 01	1.000	.2798	.0814	.4901E 03	.1228E 02	.3193E 02	.8070E 02	1.249	.1409E 04	.1789E 04	.7141	1.251	.5122E 03	46.663
20.0	14832	.2309E 07	.1236E 05	.2119E 01	.6469E 05	.1633E 06	.1168E 01	.1889E 01	1.000	.2793	.0811	.5158E 03	.1235E 02	.3345E 02	.8508E 02	1.250	.1245E 04	.1585E 04	.7116	1.251	.5389E 03	46.818
20.5	14837	.1947E 07	.1095E 05	.2018E 01	.5730E 05	.1844E 06	.1109E 01	.1052E 01	1.000	.2790	.0808	.5418E 03	.1238E 02	.3501E 02	.8959E 02	1.251	.1102E 04	.1408E 04	.7091	1.252	.5660E 03	46.970
21.0	14841	.1649E 07	.9718E 06	.1924E 01	.5090E 05	.2077E 06	.1054E 01	.9341E 02	1.000	.2786	.0805	.5686E 03	.1242E 02</td									

Table I continued

$T_t = 6000^{\circ}\text{K}$ $P_t = 500 \text{ atmospheres}$ $\rho_t = 20.63 \text{ atmospheres}$ $H_t = 105.54 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.103$ $S/R_t = 31.837$

M	U	p/p_1	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/H_t	ρU	Z	M_2	U_2/U_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_1	S/R_2	
0.9972	4731	*5592E 00	.6238E 00	.9070E 00	.3417E 00	.1000E 01	.8939E 00	.4916E 04	1.090													
2.0	8272	*1345E 00	.1933E 00	.7264E 00	.3235E 00	.1846E 01	.6758E 00	.2663E 04	1.056	*5452	.3241	.4252E 01	.3085E 01	.1316E 01	.1429E 01	1.106	.6853E 00	.6906E 00	.9852	1.111	.5096E 01	32.255
2.5	9573	*5592E-01	.9287E-01	.6401E 00	.2082E 00	.3320E 01	.5658E 00	.1481E 04	1.037	*6469	.2386	.6669E 01	.4191E 01	.1477E 01	.1724E 01	1.117	.4256E 00	.4333E 00	.9668	1.120	.7611E 01	32.786
3.0	10646	*2163E-01	.4182E-01	.5589E 00	.1159E 00	.6630E 01	.4631E 00	.7415E 03	1.020	*4129	.1898	.9685E 01	.5269E 01	.1659E 01	.2118E 01	1.130	.2326E 00	.2399E 00	.9438	1.133	.1075E 02	33.466
3.5	11520	*8013E-02	.1825E-01	.4805E 00	.5924E-01	.1404E 02	.3713E 00	.3501E 03	1.008	*3772	.1593	.1343E 01	.6278E 01	.1885E 01	.2651E 01	1.144	.1175E 00	.1230E 00	.9188	1.146	.1466E 02	34.244
4.0	12202	*3001E-02	.8164E-02	.4046E 00	.2974E-01	.2963E 02	.2946E 00	.1659E 03	1.002	*3526	.1397	.1805E 02	.7157E 01	.2184E 01	.3348E 01	1.157	.5847E-01	.6217E-01	.8948	1.159	.1948E 02	35.047
4.5	12696	*1229E-02	.4010E-02	.3378E 00	.1581E-01	.5798E 02	.2364E 00	.8479E 02	1.000	*3368	.1274	.2345E 02	.7851E 01	.2559E 01	.4178E 01	1.168	.3091E-01	.3332E-01	.8745	1.170	.2515E 02	35.788
5.0	13048	.5588E-03	.2169E-02	.2841E 00	.9032E-02	.1043E 03	.1934E 00	.4713E 01	1.000	*3254	.1193	.2347E 02	.8385E 01	.2987E 01	.5111E 01	1.177	.1757E-01	.1917E-01	.8579	1.178	.3145E 02	36.451
5.5	13310	.2745E-03	.1255E-02	.2411E 00	.5441E-02	.1766E 03	.1607E 00	.2783E 02	1.000	*3171	.1134	.3614E 02	.8816E 01	.3464E 01	.6157E 01	1.184	.1054E-01	.1162E-01	.8440	1.185	.3841E 02	37.055
6.0	13504	*1465E-03	.7787E-03	.2075E 00	.3474E-02	.2807E 03	.1360E 00	.1752E 02	1.000	*3120	.1093	.9432E 02	.9152E 01	.3972E 01	.7278E 01	1.189	.6725E-02	.7481E-02	.8325	1.191	.4589E 02	37.590
6.5	13661	.8109E-04	.4977E-03	.1797E 00	.2272E-02	.4342E 03	.1159E 00	.1132E 02	1.000	*3079	.1060	.5107E 02	.9433E 01	.4534E 01	.8543E 01	1.194	.4390E-02	.4923E-02	.8224	1.196	.5414E 02	38.099
7.0	13786	*4675E-04	.3290E-03	.1567E 00	.1530E-02	.6507E 02	.9964E 01	.7555E 01	1.000	*3042	.1034	.5966E 02	.9675E 01	.5145E 01	.9939E 01	1.198	.2951E-02	.3334E-02	.8136	1.200	.6312E 02	38.574
7.5	13887	.2789E-04	.2393E-03	.1374E 00	.1056E-02	.9495E 03	.8632E-01	.5178E 01	1.000	*3013	.1012	.6905E 02	.9884E 01	.5812E 01	.1148E 02	1.202	.2035E-02	.2315E-02	.7956	1.203	.7295E 02	39.021
8.0	13970	.1726E-04	.1569E-03	.1213E 00	.7492E-03	.1346E 04	.7543E-01	.3651E 01	1.000	*2990	.0994	.7917E 02	.1006E 02	.6529E 01	.1314E 02	1.205	.1443E-02	.1652E-02	.7988	1.206	.8360E 02	39.435
8.5	14037	.1104E-04	.1130E-03	.1077E 00	.5447E-03	.1861E 04	.6645E-01	.2642E 01	1.000	*2972	.0979	.9000E 02	.1022E 02	.7295E 01	.1491E 02	1.208	.1048E-02	.1206E-02	.7926	1.209	.9495E 02	39.821
9.0	14094	.7269E-05	.8330E-04	.9622E-01	.4048E-03	.2514E 04	.5897E-01	.1955E 01	1.000	*2957	.0966	.1016E 03	.1035E 02	.8111E 01	.1681E 02	1.210	.7783E-03	.9006E-03	.7869	1.211	.1071E 03	40.182
9.5	14140	.4928E-05	.6289E-04	.8647E-01	.3073E-03	.3322E 03	.5274E-01	.1480E 01	1.000	*2944	.0955	.1139E 03	.1047E 02	.8967E 01	.1880E 02	1.212	.5909E-03	.6872E-03	.7817	1.213	.1199E 03	40.516
10.0	14179	.3425E-05	.4932E-04	.7816E 00	.2377E-03	.4308E 04	.4748E-01	.1141E 01	1.000	*2933	.0945	.1266E 03	.1058E 02	.9863E 01	.2088E 02	1.214	.4569E-03	.5338E-03	.7769	1.215	.1334E 03	40.828
10.5	14213	.2433E-05	.3778E-04	.7100E 00	.1867E-03	.5497E 04	.4301E 01	.8943E 00	1.000	*2924	.0937	.1401E 03	.1067E 02	.1080E 02	.2306E 02	1.215	.3587E-03	.4209E-03	.7725	1.216	.1474E 03	41.122
11.0	14241	*1761E-05	.2997E-05	.6481E 01	.1487E-03	.5917E 04	.3916E-01	.7108E 00	1.000	*2917	.0929	.1541E 03	.1076E 02	.1177E 02	.2533E 02	1.217	.2856E-03	.3363E-03	.7683	1.218	.1622E 03	41.399
11.5	14266	.1297E-05	.5942E 01	.1199E-03	.8595E 04	.3582E-01	.5720E 00	1.000	*2909	.0922	.1687E 03	.1065E 02	.12778E 02	.2766E 02	1.218	.2303E-03	.2725E-03	.7644	1.219	.1775E 03	41.661	
12.0	14287	*9688E-06	.1954E-04	.5468E-01	.9756E-04	.1057E 05	.3290E-01	.4644E 00	1.000	*2904	.0916	.1839E 03	.1092E 02	.1381E 02	.2015E 02	1.221	.1874E-03	.2226E-03	.7606	1.220	.1934E 03	41.913
12.5	14306	.7331E-06	.1601E-04	.5050E 01	.8014E-04	.1289E 05	.3033E 01	.3814E 00	1.000	*2898	.0910	.1997E 03	.1099E 02	.1370E 02	.2120	.1539E 03	.1835E 03	.7571	1.222	.2099E 03	42.153	
13.0	14323	.5568E-06	.1322E-04	.4676E 01	.6634E-05	.1595E 05	.2834E-01	.3153E 00	1.000	*2892	.0904	.2126E 03	.1106E 02	.1600E 02	.2306E 02	1.221	.1274E 03	.1524E 03	.7537	1.223	.2271E 03	42.384
13.5	14358	*4537E-06	.1100E-04	.4347E 01	.5533E-04	.1871E 05	.2600E-01	.1150E 00	1.000	*2887	.0899	.2331E 03	.1112E 02	.1715E 02	.2381E 02	1.223	.1062E 03	.1279E 03	.7504	1.224	.2449E 03	42.606
14.0	14392	.3362E-06	.9211E-05	.4049E 01	.2233E-05	.2421E-01	.2202E 00	.1100	*2882	.0894	.2348E 03	.1118E 02	.1834E 02	.2410E 02	1.224	.8910E-04	.1074E 03	.7472	1.225	.2634E 03	42.882	
14.5	14364	*2660E-06	.7759E-05	.3780E 01	.3916E-04	.5264E 05	.2252E 01	.1856E 00	1.000	*2877	.0890	.2692E 03	.1124E 02	.1956E 02	.2406E 02	1.224	.7519E 04	.9091E 04	.7441	1.226	.1827E 03	43.030
15.0	14375	.2100E-06	.6576E-05	.3538E 01	.3324E-05	.3212E 05	.2103E 01	.1575E 00	1.000	*2872	.0885	.2802E 03	.1130E 02	.2028E 02	.2478E 02	1.225	.6381E 04	.7741E 04	.7412	1.226	.3024E 03	43.231
15.5	14385	*1686E-06	.5604E-05	.3318E 01	.2837E-05	.3626E 05	.1968E-01	.1434E 00	1.000	*2869	.0882	.3076E 03	.1144E 02	.2121E 02	.2542E 02	1.226	.5642E 04	.6623E 04	.7373	1.227	.3273E 03	43.426
16.0	14394	.1356E-06	.4796E-05	.3118E 01	.2431E-04	.3276E 05	.1845E-01	.1150E 00	1.000	*2864	.0878	.3279E 03	.1140E 02	.2344E 02	.2945E 02	1.227	.4665E 04	.5694E 04	.7355	1.228	.3440E 03	43.616
16.5	14402	.1097E-06	.4123E-05	.2995E 01	.2092E-04	.4971E 05	.1733E-01	.9890E 00	1.000	*2860	.0874	.3448E 03	.1144E 02	.2483E 02	.3072E 02	1.228	.4017E-04	.4918E-04	.7328	1.229	.3660E 03	43.799
17.0	14410	.8940E-07	.3562E-05	.2768E 01	.1809E-04	.3751E 05	.16320E-01	.8549E 01	1.000	*2856	.0870	.3704E 03	.1149E 02	.2623E 02	.4089E 02	1.228	.3474E-04	.4266E-04	.7302	1.230	.3885E 03	43.978
17.5	14416	.7326E-07	.3090E-05	.2615E 01	.1571E-04	.6626E 05	.1536E 01	.7419E 01	1.000	*2852	.0867	.3925E 03	.1154E 02	.2767E 02	.6462E 02	1.229	.3016E 04	.3715E 04	.7276	1.230	.4116E 03	44.152
18.0	14423	.6035E-07	.2690E-05	.2474E 01	.1369E-04	.7607E 05	.1449E 01	.6463E 00	1.000	*2849	.0863	.4153E 03	.1158E 02	.2915E 02	.6849E 02	1.230	.2627E 04	.3246E 04	.7251	1.231	.4354E 03	44.321
18.5	14429	.4996E-07	.2351E-05	.2343E 01	.1197E-04	.8702E 05	.1369E 01	.6449E 00	1.000	*2845	.0860	.4389E 03	.1163E 02	.3057E 02	.7249E 02	1.231	.2298E 04	.2847E 04	.7227	1.232	.4600E 03	44.486
19.0	14434	.4156E-07	.2061E-05	.2223E 01	.1051E-04	.9921E 05	.1296E 01	.6436E 00	1.000	*2841	.0857	.4632E 03	.1167E 02	.3223E 02	.7662E 02	1.231	.2017E 04	.2506E 04	.7203	1.232	.4853E 03	44.647
19.5	14439	.3474E-07	.1814E-05	.2112E 01	.9250E-05	.1127E 05	.1227E 01	.4361E 01	1.000	*2836	.0854	.4480E 03	.1172E 02	.3381E 02	.8088E 02	1.232	.1776E 04	.2212E 04	.7180	1.233	.5113E 03	44.803
20.0	14444	.2917E-07	.1601E-05	.2099E 01	.8170E-05	.1277E 05	.1164E 01	.3851E 01	1.000	*2836	.0851	.5133E 03	.1175E 02	.3544E 02	.8528E 02	1.232	.1569E 04	.1959E 04	.7157	1.234	.3378E 03	44.957
20.5	14448	.2450E-07	.1417E-05	.1914E 01	.7378E-05	.1441E 06	.1105E 01	.3411E 01	1.000	*2833	.0848	.5359E 03	.1179E 02	.3710E 02	.8981E 02	1.233	.1390E 04	.1740E 04	.7135	1.234	.5650E 03	45.106
21.0	14452	.2082E-07	.1258E-05	.1825E 01	.6429E-05	.1623E 06	.1051E-01	.3029E 01</														

Table 1 continued

$T_t = 6000^{\circ}\text{K}$ $p_t = 1000 \text{ atmospheres}$ $\rho_t = 42.11 \text{ atmospheres}$ $H_t = 101.57 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.080$ $S/R_t = 30.866$

M	U	p/p_t	ρ/p_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	ρ_2/ρ_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	ρ_{t2}/ρ_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	ρ_{t2}/p_t	S/R_2
3.9969	4682	.5592E 00	.6238E 00	.9062E 00	.3414E 00	.1000E 01	.8921E 00	.9930E 04	1.069													
2.0	8196	.1338E 00	.1927E 00	.7216E 00	.3231E 00	.1850E 01	.6693E 00	.5368E 04	1.040	.5457	.3239	.4264E 01	.3088E 01	.1325E 01	.1442E 01	1.084	.6842E 00	.6891E 00	.9860	1.088	.5112E 01	31.277
2.5	9482	.5552E-01	.9267E-01	.6317E 00	.2080E 00	.3324E 01	.5573E 00	.2988E 04	1.025	.4652	.2388	.6704E 01	.4187E 01	.1499E 01	.1749E 01	1.095	.4250E 00	.4321E 00	.9681	1.098	.7655E 01	31.797
3.0	10534	.2151E-01	.4207E-01	.5460E 00	.1166E 00	.6590E 01	.4537E 00	.1507E 04	1.012	.4143	.1906	.9770E 01	.5247E 01	.1702E 01	.2160E 01	1.107	.2335E 00	.2404E 00	.9456	1.110	.1085E 02	32.457
3.5	11372	.6121E-02	.1889E-01	.4641E 00	.6081E-01	.1364E 00	.3633E 00	.7282E 04	1.004	.3797	.1609	.1356E 02	.6214E 01	.1955E 01	.2707E 01	1.121	.1204E 00	.1258E 00	.9208	1.123	.1482E 02	33.196
4.0	12015	.3139E-02	.8741E-02	.3878E 00	.3150E-01	.2781E 02	.2893E 00	.3567E 03	1.001	.3565	.1420	.1822E 02	.7042E 01	.2283E 01	.1134	.6183E-01	.6559E-01	.8967	1.136	.1970E 02	33.948	
4.5	12473	.1341E-02	.4445E-02	.3244E 00	.1734E-01	.5245E 02	.2341E 00	.1893E 04	1.000	.3408	.1300	.2390E 02	.7692E 01	.2666E 01	.4216E 01	1.149	.3285E-01	.3640E-01	.8758	1.147	.2525E 02	34.635
5.0	12808	.6226E-03	.2461E-02	.2734E 00	.1008E-01	.9267E 02	.1924E 00	.1071E 03	1.000	.3294	.1218	.2943E 02	.8211E 01	.3103E 01	.5136E 01	1.155	.1950E-01	.2132E-01	.8578	1.157	.3148E 02	35.265
5.5	13065	.3086E-03	.1427E-02	.2316E 00	.6084E-02	.1586E 00	.6341E 02	.3209	1.157	.3616E 02	.8841E 01	.3597E 01	.6193E 01	1.163	.1178E-01	.1297E-01	.8419	1.183	.3848E 02	35.86		
6.0	13254	.1642E-03	.8896E-03	.1994E 00	.3901E-02	.2477E 03	.1352E 00	.4008E 04	1.000	.3151	.1114	.4322E 02	.8578E 01	.7316E 01	.1170	.7545E-02	.8594E-02	.8289	1.172	.4599E 02	36.377	
6.5	13406	.9117E-04	.5704E-03	.1727E 00	.2559E-02	.3820E 03	.1153E 00	.2600E 02	1.000	.3103	.1079	.2172E 02	.9264E 01	.4686E 01	.4593E-02	.5544E-02	.8173	1.178	.6559E-01	36.875		
7.0	13528	.5265E-04	.3779E-03	.1505E 00	.1727E-02	.5713E 03	.9909E-01	.1738E 02	1.000	.3060	.1052	.5968E 02	.9509E 01	.5311E 01	.9991E 01	1.182	.3327E-02	.3765E-02	.8072	1.183	.6319E 02	37.341
7.5	13627	.3151E-04	.2579E-03	.1320E 00	.1193E-02	.8210E 03	.8586E-01	.1195E 02	1.000	.3026	.1029	.6998E 02	.9710E 01	.5992E 01	.1153E 02	1.186	.2305E-02	.2624E-02	.7984	1.188	.7306E 02	37.778
8.0	13767	.1954E-04	.1813E-03	.1165E 00	.8508E-02	.1176E 04	.7560E-01	.8447E 01	1.000	.2998	.1040	.7922E 02	.9898E 01	.6725E 01	.1320E 02	1.190	.1636E-02	.1876E-02	.7907	1.191	.8372E 02	38.184
8.5	13773	.1254E-04	.1309E-03	.1038E 00	.6201E-03	.1620E 04	.6035E-01	.6318E 01	1.000	.2976	.0995	.9008E 02	.1005E 02	.7508E 01	.1498E 02	1.193	.1193E-02	.1376E-02	.7839	1.195	.9515E 02	38.561
9.0	13827	.8282E-04	.9682E-04	.2942E-01	.4522E-01	.2182E 04	.3874E-01	.4552E 01	1.000	.3098	.1092	.1016E 03	.1018E 02	.8341E 01	.1687E 02	1.196	.8881E-03	.1030E-02	.7780	1.197	.1072E 03	38.914
9.5	13872	.5632E-05	.7324E-04	.8309E-01	.3519E 03	.2875E 04	.5257E-01	.3454E 01	1.000	.2942	.0971	.1138E 03	.1030E 02	.9216E 01	.1885E 02	1.199	.6756E-03	.7876E-03	.7727	1.200	.1200E 03	39.241
10.0	13911	.3925E-05	.5645E-04	.7512E-01	.2727E-03	.3719E 04	.4733E-01	.2670E 01	1.000	.2930	.0961	.1266E 03	.1040E 02	.1013E 02	.2093E 02	1.201	.5237E-03	.6130E-03	.7679	1.202	.1334E 03	39.547
10.5	13943	.2793E-05	.4421E-04	.6826E-01	.2146E 03	.4738E 04	.4292E-01	.2096E 01	1.000	.2920	.0953	.1399E 03	.1049E 02	.1109E 02	.2310E 02	1.203	.4120E-03	.4842E-03	.7636	1.204	.1475E 03	39.836
11.0	13971	.2026E-05	.3513E-04	.6233E-01	.1712E-03	.5952E 04	.3910E-01	.1668E 01	1.000	.2911	.0946	.1539E 03	.1057E 02	.1208E 02	.2536E 02	1.205	.2385E-03	.3876E-03	.7596	1.206	.1621E 03	40.109
11.5	13995	.1494E-04	.2824E-04	.5716E-01	.1381E 03	.7390E 04	.3577E-01	.1344E 01	1.000	.2903	.0939	.1685E 03	.1065E 02	.1311E 02	.2772E 02	1.206	.2650E-03	.3137E-03	.7559	1.207	.1774E 03	40.368
12.0	14016	.1117E-05	.2294E-04	.5261E-01	.1125E 01	.9085E 04	.3286E-01	.1093E 01	1.000	.2898	.0933	.1826E 03	.1072E 02	.1418E 02	.3017E 02	1.208	.2154E-03	.2563E-03	.7524	1.209	.1932E 03	40.616
12.5	14035	.8455E-06	.1880E-04	.4859E-01	.9245E-04	.1107E 05	.3029E-01	.8970E 00	1.000	.2891	.0928	.1993E 03	.1078E 02	.1529E 02	.3273E 02	1.209	.1774E-03	.2114E-03	.7492	1.210	.2098E 03	40.853
13.0	14051	.6473E-06	.1553E-04	.4502E-01	.7657E-04	.1338E 05	.2801E-01	.7420E 00	1.000	.2885	.0922	.2157E 03	.1084E 02	.1644E 02	.3540E 02	1.210	.1469E-03	.1756E-03	.7461	1.211	.2270E 03	41.081
13.5	14066	.5004E-06	.1293E-04	.4183E-01	.6385E-04	.1606E 05	.2597E-01	.6181E 00	1.000	.2881	.0918	.2327E 03	.1090E 02	.1763E 02	.3818E 02	1.211	.1225E-03	.1464E-03	.7432	1.212	.2474E 03	41.302
14.0	14079	.3902E-06	.1082E-04	.2896E-04	.5356E-04	.1917E 04	.2414E-01	.5180E 00	1.000	.2877	.0913	.2328E 03	.1095E 02	.1886E 02	.4109E 02	1.212	.1027E-03	.1235E-03	.7404	1.213	.2631E 03	41.516
14.5	14091	.3071E-06	.9120E-05	.3638E-01	.4521E 05	.2273E 05	.2249E-01	.4369E 00	1.000	.2873	.0909	.2686E 03	.1100E 02	.2012E 02	.4410E 02	1.213	.8667E-04	.1045E-04	.7377	1.214	.2822E 03	41.722
15.0	14102	.2437E-06	.7372E-05	.3405E-01	.3839E-04	.2679E 05	.1533E 01	.2101E 01	1.000	.2869	.0905	.3915E 03	.1105E 02	.2143E 02	.4722E 02	1.214	.7362E-04	.8903E-04	.7351	1.215	.3021E 03	41.920
15.5	14111	.1947E-06	.6586E-05	.3193E-01	.3274E 04	.3143E 05	.1965E 01	.3160E 00	1.000	.2866	.0901	.3070E 03	.1106E 02	.2277E 02	.5047E 02	1.215	.6289E-04	.7616E-04	.7326	1.216	.3226E 03	42.113
16.0	14120	.1565E-06	.5635E-05	.3000E-01	.2805E-04	.3670E 05	.1842E 01	.2705E 00	1.000	.2862	.0897	.3273E 03	.1114E 02	.2416E 02	.5385E 02	1.216	.5383E-04	.6545E-04	.7302	1.217	.3440E 03	42.301
16.5	14128	.1267E-06	.4847E-05	.2824E-01	.2415E 05	.1730E 01	.1293E 01	.1166E 00	1.000	.2859	.0894	.3481E 03	.1118E 02	.2558E 02	.5734E 02	1.217	.4634E-04	.5649E-04	.7278	1.218	.3657E 03	42.483
17.0	14136	.1032E-06	.4187E-05	.2664E-01	.4935E 05	.1627E-01	.2012E 00	1.000	.2856	.0891	.3696E 03	.1123E 02	.2704E 02	.6096E 02	1.218	.4007E-04	.4898E-04	.7255	1.219	.3882E 03	42.660	
17.5	14142	.8458E-07	.3632E-05	.2516E-01	.1814E-04	.5686E 05	.1533E 01	.1746E 00	1.000	.2855	.0888	.3915E 03	.1126E 02	.2854E 02	.6471E 02	1.218	.3477E-04	.4260E-04	.7233	1.219	.4111E 03	42.833
18.0	14149	.6966E-07	.3162E-05	.2380E-01	.1580E-04	.6529E 05	.1447E 01	.1521E 00	1.000	.2852	.0885	.4143E 03	.1130E 02	.3009E 02	.6859E 02	1.219	.3029E-04	.3721E-04	.7211	1.220	.4349E 03	43.001
18.5	14154	.5767E-07	.2763E-05	.2255E-01	.1382E-04	.7669E 05	.1367E 01	.1330E 00	1.000	.2850	.0882	.4378E 03	.1134E 02	.3167E 02	.7261E 02	1.220	.2450E-04	.3262E-04	.7190	1.221	.4595E 03	43.164
19.0	14160	.4796E-07	.2423E-05	.2140E-01	.1213E-04	.8514E 05	.1293E 01	.1166E 00	1.000	.2847	.0879	.4620E 03	.1138E 02	.3328E 02	.7575E 02	1.220	.2326E-04	.2871E-04	.7169	1.221	.4849E 03	43.323
19.5	14165	.4010E-07	.2132E-05	.2033E-01	.1068E-04	.9673E 05	.1225E-01	.1027E 00	1.000	.2846	.0877	.4865E 03	.1141E 02	.3494E 02	.8102E 02	1.221	.204E-04	.2533E-04	.7149	1.222	.5106E 03	43.479
20.0	14169	.3367E-07	.1882E-05	.1934E-01	.9432E-05	.1095E 06	.1161E-01	.9064E-01	1.000	.2844	.0874	.5120E 03	.1144E 02	.3663E 02	.8544E 02	1.221	.1810E-04	.2243E-04	.7129	1.222	.5374E 03	43.630
20.5	14173	.2839E-07	.1666E-05	.1842E-01	.8355E-05	.1237E 06	.1103E-01	.8027E 00	1.000	.2841	.0871	.5383E 03	.1148E 02	.3836E 02	.9000E 02	1.222	.1604E-04	.1922E-04	.7110	1.223	.5648E 03	43.778
21.0	14177	.2403E-07	.1479E-05	.1756E-01	.7422E-05	.1393E 06	.1048E-01	.7129E-01	1.000	.2841	.0869	.5648E 03	.11									

Table I continued

$T_t = 6000^{\circ}\text{K}$ $P_t = 2000 \text{ atmospheres}$ $\rho_t = 85.77 \text{ atmospheres}$ $H_t = 98.22 \times 10^8 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.061$ $S/R_t = 29.935$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	ρ_2/ρ_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_t	S/R_t
0.9973	4641	.5639E 00	.6284E 00	.9056E 00	.3442E 00	.1000E 01	.8903E 00	.2020E 05	1.051													
2.0	8127	.1346E 00	.1941E 00	.7158E 00	.3259E 00	.1849E 01	.6637E 00	.1092E 05	1.028	.5462	.3244	.4273E 01	.3082E 01	.1338E 01	.1453E 01	1.065	.6892E 00	.9882	1.068	.5122E 01	30.339	
2.5	9401	.5565E-01	.9394E-01	.6219E 00	.2101E 00	.3319E 01	.5500E 01	.6086E 04	1.015	.4671	.2397	.6749E 01	.4172E 01	.1528E 01	.1771E 01	1.074	.4286E 00	.9718	1.077	.7702E 01	30.484	
3.0	10430	.2165E-01	.4286E-01	.5324E 00	.1185E 00	.6526E 01	.4462E 00	.3095E 04	1.007	.4166	.1922	.9845E 01	.5204E 01	.1754E 01	.2195E 01	1.086	.2370E 00	.2431E 00	1.088	.1095E 02	31.489	
3.5	11236	.8314E-02	.1963E-01	.4987E 00	.6299E-01	.1323E 02	.3573E 00	.1527E 04	1.002	.3835	.1632	.1368E 02	.6126E 01	.2036E 01	.2750E 01	1.099	.1244E 00	.1294E 00	.9271	.1.101	.1497E 02	32.193
4.0	11842	.3318E-02	.9408E-02	.3741E 00	.3354E-01	.2618E 02	.2861E 00	.7714E 03	1.000	.3609	.1449	.1829E 02	.6903E 01	.2385E 01	.3443E 01	1.111	.6579E-01	.6931E-01	.9038	.1.113	.1981E 02	32.899
4.5	12279	.1448E-02	.4904E-02	.3132E 00	.1880E-01	.4843E 02	.2324E 00	.4170E 03	1.000	.3455	.1229	.2352E 02	.7522E 01	.2785E 01	.4245E 01	1.123	.3664E-01	.3916E-01	.8828	.1.125	.2331E 02	33.552
5.0	12604	.6800E-03	.2731E-02	.2642E 00	.1103E-01	.8473E 02	.1913E 00	.2384E 03	1.000	.3345	.1247	.2939E 02	.8022E 01	.3234E 01	.5162E 01	1.133	.2141E-01	.2317E-01	.8639	.1.135	.3149E 02	34.159
5.5	12853	.3373E-03	.1598E-02	.2239E 00	.6711E-02	.1420E 03	.1590E 00	.4142E 03	1.000	.3254	.1184	.3608E 02	.8444E 01	.3742E 01	.6214E 01	1.142	.1297E-01	.1421E-01	.8470	.1.144	.3846E 02	34.729
6.0	13038	.1808E-03	.9956E-03	.1927E 00	.4303E-02	.2247E 03	.1346E 00	.8988E 02	1.000	.3191	.1139	.4317E 02	.8782E 01	.4276E 01	.7347E 01	1.150	.8309E-02	.9198E-02	.8325	.1.151	.4599E 02	35.242
6.5	13187	.1006E-03	.6399E-03	.1668E 00	.2829E-02	.3457E 03	.1147E 00	.5843E 02	1.000	.3142	.1102	.5104E 02	.9072E 01	.4864E 01	.8624E 01	1.157	.5455E-02	.6098E-02	.8194	.1.158	.5422E 02	35.728
7.0	13307	.5817E-04	.4247E-03	.1453E 00	.1912E-01	.9860E-01	.3913E 02	.1.000	.3100	.1073	.5968E 02	.9322E 01	.5505E 01	.1004E 02	1.163	.3681E-02	.4152E-02	.8078	.1.164	.6328E 02	36.185	
7.5	13403	.3491E-04	.2907E-03	.1274E 00	.1328E-02	.7487E 03	.8548E-01	.2698E 02	1.000	.3061	.1049	.6906E 02	.9535E 01	.6199E 01	.1158E 02	1.168	.2554E-02	.2904E-02	.7976	.1.170	.7315E 02	36.612
8.0	13482	.2171E-04	.2048E-03	.1124E 00	.9466E-03	.1056E 04	.7474E-01	.1912E 02	1.000	.3029	.1029	.7922E 02	.9720E 01	.6947E 01	.1325E 02	1.173	.1820E-02	.2085E-02	.7885	.1.175	.8382E 02	37.009
8.5	13546	.1396E-04	.1483E-03	.9986E-03	.6918E-03	.1452E 04	.6589E-01	.1391E 02	1.000	.3002	.1012	.9009E 02	.9882E 01	.7744E 01	.1503E 02	1.177	.1329E-02	.1533E-02	.7806	.1.179	.9524E 02	37.379
9.0	13599	.9251E-05	.1100E-03	.8924E-01	.5172E-03	.1950E 04	.5856E-01	.1036E 02	1.000	.2981	.0998	.1016E 03	.1002E 02	.8587E 01	.1692E 02	1.181	.9930E-03	.1152E-02	.7735	.1.182	.1073E 03	37.723
9.5	13643	.6307E-05	.8339E-04	.8025E-01	.3946E-03	.2564E 04	.5244E-01	.7877E 01	1.000	.2964	.0986	.1137E 03	.1014E 02	.9473E 01	.1889E 02	1.184	.7575E-03	.8834E-03	.7673	.1.186	.1201E 03	38.044
10.0	13680	.4404E-05	.6439E-04	.7257E-01	.3054E-03	.3312E 04	.4727E-01	.6099E 01	1.000	.2948	.0976	.1265E 03	.1025E 02	.1040E 02	.2096E 02	1.187	.5879E-03	.6890E-03	.7618	.1.188	.1339E 03	38.344
10.5	13712	.3140E-05	.5051E-05	.6596E-01	.2414E-03	.4212E 04	.4285E-01	.4795E 01	1.000	.2935	.0967	.1398E 03	.1034E 02	.1137E 02	.2313E 02	1.190	.4631E-03	.5451E-03	.7568	.1.191	.1475E 03	38.628
11.0	13739	.2282E-05	.4018E-04	.6025E-01	.1928E-03	.5288E 04	.3904E-01	.3822E 01	1.000	.2921	.0959	.1538E 03	.1043E 02	.1237E 02	.2358E 02	1.192	.3699E-03	.4372E 03	.7523	.1.193	.1621E 03	38.896
11.5	13763	.1683E-05	.3232E-04	.5526E-01	.1556E-03	.6555E 04	.3573E-01	.3080E 01	1.000	.2910	.0952	.1683E 03	.1050E 02	.1342E 02	.2774E 02	1.194	.2985E-03	.3541E-03	.7482	.1.195	.1773E 03	39.152
12.0	13784	.1259E-05	.2627E-04	.5087E-01	.1269E-03	.8057E 04	.3283E-01	.2507E 01	1.000	.2900	.0946	.1833E 03	.1057E 02	.1450E 02	.3020E 02	1.196	.2432E-03	.2896E-03	.7444	.1.197	.1931E 03	39.397
12.5	13802	.9536E-06	.2135E-04	.4696E-03	.1043E-03	.3026E-01	.2058E 01	.1.000	.2891	.0940	.1991E 03	.1064E 02	.1563E 02	.3276E 02	1.198	.1985E-03	.2387E-03	.7410	.1.199	.2096E 03	39.632	
13.0	13818	.7304E-06	.1780E-06	.4354E-01	.8641E-04	.1186E 05	.2799E-01	.1703E 01	1.000	.2883	.0935	.2154E 03	.1070E 02	.1679E 02	.3543E 02	1.199	.1656E-03	.1984E-03	.7377	.1.200	.2267E 03	39.858
13.5	13832	.5645E-06	.1481E-04	.4045E-01	.7204E-05	.2594E 05	.1840E-01	.1418E 01	1.000	.2877	.0930	.2323E 03	.1075E 02	.1800E 02	.3822E 02	1.201	.1308E-03	.1659E-03	.7347	.1.202	.2445E 03	40.077
14.0	13845	.4404E-06	.1240E-04	.3768E-01	.6044E-04	.1699E 05	.2411E-01	.1189E 01	1.000	.2869	.0926	.2500E 03	.1080E 02	.1925E 02	.4112E 02	1.202	.1159E-03	.1396E-03	.7319	.1.203	.2631E 03	40.287
14.5	13857	.3467E-06	.1045E-04	.3519E-01	.5104E-04	.2014E 05	.2247E-01	.1003E 01	1.000	.2864	.0922	.2682E 03	.1085E 02	.2054E 02	.4413E 02	1.203	.9784E-04	.1182E-03	.7292	.1.204	.2822E 03	40.491
15.0	13868	.2751E-06	.8861E-05	.3293E-01	.4333E-04	.2374E 01	.1809E-01	.2808E 00	1.000	.2859	.0918	.2870E 03	.1089E 02	.2187E 02	.4726E 02	1.204	.8306E-04	.1006E-03	.7267	.1.205	.3020E 03	40.688
15.5	13877	.2196E-06	.7546E-05	.3088E-01	.3695E-04	.2786E 05	.1963E-01	.7251E 00	1.000	.2854	.0914	.3066E 03	.1094E 02	.2325E 02	.5059E 02	1.205	.7082E-04	.8601E-04	.7243	.1.206	.3225E 03	40.880
16.0	13886	.1766E-06	.6458E-05	.2901E-01	.3166E 05	.3253E 05	.1840E-01	.6210E 00	1.000	.2850	.0911	.3268E 03	.1098E 02	.2467E 02	.5391E 02	1.206	.6067E-04	.7386E-04	.7219	.1.207	.3435E 03	41.067
16.5	13894	.1430E-06	.5555E-05	.2732E-01	.2727E-04	.3779E 05	.1728E-01	.5344E 00	1.000	.2848	.0908	.3475E 03	.1101E 02	.2613E 02	.5741E 02	1.207	.5223E-04	.6373E-04	.7197	.1.208	.3652E 03	41.248
17.0	13901	.1165E-06	.4799E-05	.2576E-01	.2358E-04	.4372E 05	.1625E-01	.4619E 00	1.000	.2845	.0905	.3690E 03	.1106E 02	.2763E 02	.6104E 02	1.208	.4519E-04	.5525E-04	.7176	.1.209	.3878E 03	41.423
17.5	13908	.9545E-07	.4162E-05	.2433E-01	.2047E-04	.5039E 05	.1531E-01	.4008E 00	1.000	.2842	.0902	.3911E 03	.1109E 02	.2917E 02	.6479E 02	1.209	.3924E-04	.4808E-04	.7156	.1.210	.4110E 03	41.593
18.0	13914	.7861E-07	.3623E-05	.2302E-01	.1783E-04	.5786E 05	.1444E-01	.3491E 00	1.000	.2839	.0899	.4199E 03	.1113E 02	.3075E 02	.6686E 02	1.210	.3420E-04	.4199E-04	.7137	.1.211	.4350E 03	41.760
18.5	13920	.6508E-07	.3166E-05	.2181E-01	.1560E-04	.6619E 05	.1364E-01	.3052E 00	1.000	.2838	.0896	.4372E 03	.1116E 02	.3237E 02	.7271E 02	1.210	.2990E-04	.3679E-04	.7118	.1.211	.4594E 03	41.922
19.0	13925	.5415E-07	.2777E-05	.2069E-01	.1369E-04	.7544E 05	.1291E-01	.2677E 00	1.000	.2837	.0894	.4611E 03	.1119E 02	.3404E 02	.7687E 02	1.211	.2624E-04	.3235E-04	.7100	.1.212	.4845E 03	42.081
19.5	13930	.4527E-07	.2443E-05	.1966E-01	.1205E-04	.8571E 05	.1232E-01	.2356E 00	1.000	.2836	.0892	.4858E 03	.1122E 02	.3574E 02	.8116E 02	1.212	.2310E-04	.2893E-04	.7082	.1.213	.5102E 03	42.236
20.0	13934	.3808E-07	.2156E-05	.1870E-01	.9244E-04	.9708E 05	.1150E-01	.2050E 00	1.000	.2833	.0889	.5139E 03	.1125E 02	.3749E 02	.8566E 02	1.212	.2040E-04	.2525E-04	.7062	.1.213	.5366E 03	42.286
20.5	13938	.3204E-07	.1961E-05	.1781E-01	.8242E-04	.1018E-01	.1842E 00	1.000	.2833	.0887	.5371E 03	.1127E 02	.3927E 02	.9058E 02	1.213	.1808E-04	.2240E-04	.7048	.1.214	.5683E 03	42.384	
21.0	13942	.2713E-07	.1695E-05	.1698E-01	.8377E-05	.1234E 06	.1046E-01	.1636E 00	1.000	.												

Table I continued

$T_t = 7000^\circ\text{K}$ $p_t = 100 \text{ atmospheres}$ $p_t = 3.20 \text{ atmospheres}$ $H_t = 147.85 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.219$ $S/R_t = 35.805$

M	U	p/p_t	p/p_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9987	5366	.5633E 00	.6197E 00	.9217E 00	.3383E 00	.1000E 01	.9026E 00	.8586E 03	1.203													
2.0	9527	.1290E 00	.1852E 00	.7287E 00	.3188E 00	.1885E 01	.6930E 00	.4556E 03	1.166	.5455	.3150	.4385E 01	.3174E 01	.1318E 01	.1399E 01	1.221	.6742E 00	.6811E 00	.9839	1.227	.5226E 01	36.287
2.5	10924	.5576E-01	.9350E-01	.6365E 00	.2116E 00	.3255E 01	.5964E 00	.2638E 03	1.142	.4719	.2366	.6794E 01	.4227E 01	.1492E 01	.1639E 01	1.230	.4319E 00	.4415E 00	.9652	1.235	.7747E 01	36.835
3.0	12044	.2311E-01	.4492E-01	.5626E 00	.1236E 00	.6146E 01	.5094E 00	.1397E 03	1.115	.4234	.1910	.5649E 01	.5235E 01	.1657E 01	.1928E 01	1.240	.2478E 00	.2571E 00	.9447	1.244	.1072E 02	37.523
3.5	12987	.9086E-02	.2031E-01	.5022E 00	.6497E-01	.1260E 00	.4246E 00	.6813E 02	1.086	.3880	.1606	.1300E 02	.6227E 01	.1813E 01	.2294E 01	1.251	.1290E 00	.1364E 00	.9203	1.254	.1420E 02	38.337
4.0	13796	.3396E-02	.8699E-02	.4499E 00	.3140E-01	.2770E 02	.3562E 00	.3099E 02	1.058	.3604	.1387	.1693E 02	.7210E 01	.1970E 01	.2772E 01	1.261	.6200E-01	.6693E-01	.8938	1.264	.1826E 02	39.259
4.5	14491	.1223E-02	.3591E-02	.4020E 00	.1430E-01	.6389E 02	.2898E 00	.1344E 02	1.033	.3389	.1223	.2152E 02	.8174E 01	.2139E 01	.3414E 01	1.271	.2813E-01	.3108E-01	.8662	1.274	.2299E 02	40.261
5.0	15086	.4279E-03	.1545E-02	.3540E 00	.6275E-02	.1516E 03	.2303E 00	.5664E 01	1.014	.3215	.1098	.2710E 02	.9106E 01	.2355E 01	.4301E 01	1.281	.1231E-01	.1394E-01	.8386	1.283	.2876E 02	41.317
5.5	15574	.1503E-03	.6068E-03	.3012E 00	.2791E-02	.3518E 03	.1797E-00	.2440E 01	1.003	.3079	.1005	.3441E 02	.9967E 01	.2684E 01	.5518E 01	1.290	.5456E-02	.6342E-02	.8124	1.292	.3633E 03	42.363
6.0	15900	.6394E-04	.3072E-03	.2537E 00	.1473E-02	.6807E 03	.1450E 00	.1261E 01	1.003	.2991	.0943	.4272E 02	.1060E 02	.3111E 01	.6845E 01	1.296	.2874E-02	.3406E-02	.7925	1.298	.4495E 02	43.194
6.5	16113	.3280E-04	.1832E-03	.2183E 00	.9020E-03	.1126E 04	.1220E 00	.7623E 00	1.000	.2934	.0905	.5102E 02	.1105E 02	.3137E 01	.8140E 01	1.301	.1757E-02	.2114E-02	.7777	1.303	.5356E 03	43.833
7.0	16272	.1825E-04	.1171E-03	.1900E 00	.5880E-03	.1745E 04	.1045E 00	.4921E 00	1.000	.2889	.0875	.5979E 02	.1142E 02	.4010E 01	.9506E 01	1.305	.1144E-02	.1395E-02	.7650	1.307	.6267E 02	44.393
7.5	16397	.1076E-04	.7840E-04	.1673E 00	.3997E-03	.2587E 04	.9068E-01	.3320E 00	1.000	.2853	.0852	.6896E 02	.1174E 02	.4489E 01	.1095E 01	1.309	.7767E-03	.9585E-03	.7539	1.311	.7220E 02	44.900
8.0	16500	.6593E-05	.5381E-04	.1480E 00	.2778E-03	.3745E 04	.7919E-01	.2293E 00	1.000	.2823	.0832	.7894E 02	.1202E 02	.5005E 01	.1255E 02	1.312	.5359E-03	.6734E-03	.7436	1.314	.8257E 03	45.378
8.5	16586	.4090E-05	.3787E-04	.1317E 00	.1976E-03	.5294E 04	.6962E-01	.1622E 00	1.000	.2795	.0814	.8971E 02	.1228E 02	.5555E 01	.1472E 02	1.315	.3834E-03	.4837E-03	.7341	1.317	.9373E 02	45.826
9.0	16658	.2528E-04	.2724E-04	.1177E 00	.1433E 03	.7329E 04	.6156E-01	.1171E 00	1.000	.2770	.0799	.1013E 02	.1252E 02	.6144E 02	.1615E 02	1.317	.2779E-03	.3542E-03	.7253	1.319	.1057E 03	46.251
9.5	16717	.1793E-05	.2005E-04	.1057E 00	.1063E-03	.9920E 04	.5481E-01	.8655E-01	1.000	.2748	.0785	.1137E 03	.1273E 02	.6765E 01	.1814E 02	1.320	.2060E-03	.2650E-03	.7173	1.322	.6267E 02	46.647
10.0	16768	.1178E-05	.1506E-05	.9536E-01	.8028E-04	.3137E 05	.4909E-01	.6520E-01	1.000	.2700	.0774	.1266E 03	.1292E 02	.7422E 01	.2025E 02	1.322	.1556E-03	.2019E-03	.7099	1.324	.1321E 03	47.019
10.5	16811	.8170E-06	.1152E-06	.8644E-01	.6176E-04	.4423E 01	.5002E 01	1.000	.2714	.0764	.1406E 03	.1309E 02	.8110E 01	.2248E 02	1.324	.1197E-03	.1566E-03	.7031	1.326	.1465E 03	47.366	
11.0	16847	.5790E-06	.8971E-06	.7870E-01	.4829E-04	.2200E 05	.4008E-01	.3903E-01	1.000	.2698	.0754	.1552E 03	.1526E 02	.8829E 01	.2481E 02	1.326	.9388E-04	.1233E-03	.6969	1.328	.1616E 03	47.692
11.5	16878	.4191E-06	.7099E-05	.7198E-01	.3835E 04	.2775E 05	.3652E-01	.3094E 01	1.000	.2685	.0746	.1703E 02	.1340E 02	.9597E 01	.2742E 02	1.328	.7431E-04	.9863E-04	.6911	1.329	.1773E 03	47.999
12.0	16905	.3087E-06	.5694E-05	.6610E-01	.3086E-04	.3454E 05	.3243E-01	.2486E-01	1.000	.2672	.0739	.1861E 03	.1354E 02	.1034E 02	.2975E 02	1.329	.5978E-04	.7980E-04	.6856	1.331	.2107E 03	48.288
12.5	16929	.2309E-06	.4622E-05	.6093E-01	.2512E-04	.4250E 05	.3074E-01	.2020E-01	1.000	.2661	.0732	.2026E 02	.1366E 02	.1114E 02	.3237E 02	1.331	.4865E-04	.6542E-04	.6806	1.332	.4865E 03	48.563
13.0	16950	.1752E-06	.3791E-05	.5636E-01	.2065E-04	.5175E 05	.2837E-01	.1659E-01	1.000	.2651	.0726	.2195E 03	.1378E 02	.1196E 02	.3507E 02	1.332	.3599E-04	.5409E-04	.6758	1.334	.2282E 03	48.824
13.5	16964	.1347E-06	.3140E-05	.5231E-01	.1714E-04	.6424E 05	.2628E-01	.1376E-01	1.000	.2641	.0720	.2371E 03	.1369E 02	.1280E 02	.3786E 02	1.334	.3319E-04	.4515E-04	.6714	1.335	.2465E 03	49.073
14.0	16984	.1046E-06	.2621E-05	.4740E-01	.1434E-04	.7470E 05	.2442E-01	.1149E-01	1.000	.2632	.0715	.2555E 02	.1399E 02	.1367E 02	.4075E 02	1.335	.2776E-04	.4077E-04	.6671	1.336	.2653E 03	49.311
14.5	16999	.8210E-07	.2203E-05	.4543E-01	.1207E-04	.8878E 05	.2275E-01	.1000	.2622	.0709	.2742E 03	.1410E 02	.1456E 02	.4374E 02	1.336	.2399E-04	.3215E-04	.6631	1.338	.2849E 04	49.540	
15.0	17012	.6499E-07	.1864E-05	.4250E-01	.1023E-04	.1040E 05	.2125E-01	.8190E-01	1.000	.2614	.0705	.2924E 03	.1419E 02	.1457E 02	.4684E 02	1.337	.1688E-04	.2738E-04	.6592	1.339	.2046E 03	49.762
15.5	17023	.5185E-07	.1587E-05	.3985E-01	.8720E-05	.1231E 06	.1989E-01	.6975E-02	1.000	.2606	.0700	.3137E 03	.1429E 02	.1644E 02	.5005E 02	1.338	.1689E-04	.2345E-04	.6555	1.340	.2375E 03	49.976
16.0	17034	.4170E-07	.1358E-05	.3744E-01	.7472E-05	.1437E 06	.1865E-01	.5973E 02	1.000	.2600	.0696	.3242E 03	.1437E 02	.1737E 02	.53935E 02	1.339	.1447E-04	.2019E-04	.6520	1.341	.2465E 03	50.184
16.5	17044	.3397E-07	.1167E-05	.3524E-01	.6430E 05	.1671E 06	.3227E-05	.1753E-01	1.000	.2592	.0692	.3558E 03	.1446E 02	.1836E 02	.5678E 02	1.340	.1246E-04	.4747E-04	.6486	1.342	.2692E 03	50.384
17.0	17053	.2747E-07	.1008E-05	.3223E-01	.5556E-05	.1935E 06	.4615E-01	.4437E 00	1.000	.2585	.0683	.3779E 03	.1454E 02	.1938E 02	.6033E 02	1.341	.1077E-04	.1515E-04	.6453	1.343	.2392E 03	50.580
17.5	17061	.2249E-07	.8739E-06	.3138E-01	.4824E-05	.2230E 06	.1555E-01	.3850E-02	1.000	.2579	.0684	.4005E 03	.1462E 02	.2041E 02	.6399E 02	1.342	.9345E-05	.1320E-05	.6421	1.344	.4154E 03	50.770
18.0	17079	.1853E-07	.7611E-06	.2969E-01	.4205E-05	.2560E 06	.1469E-01	.3354E-02	1.000	.2574	.0681	.4236E 03	.1469E 02	.2147E 02	.6776E 02	1.343	.8142E-05	.1159E-04	.6391	1.345	.4393E 03	50.955
18.5	17075	.1523E-07	.6652E-06	.2813E-01	.3678E-05	.2928E 06	.1389E-01	.2932E-02	1.000	.2567	.0677	.4477E 03	.1477E 02	.2255E 02	.7165E 02	1.344	.7124E-05	.1019E-04	.6361	1.345	.4641E 03	51.135
19.0	17082	.1276E-07	.5831E-06	.2669E-01	.3227E-05	.3338E 06	.1315E-01	.2972E-02	1.000	.2561	.0674	.4742E 03	.1484E 02	.2368E 02	.7568E 02	1.345	.6252E-05	.9942E-05	.6333	1.346	.4898E 03	51.811
19.5	17088	.1067E-07	.5129E-06	.2535E-01	.2840E-05	.3794E 06	.1247E-01	.2263E-02	1.000	.2555	.0671	.4797E 03	.1491E 02	.2482E 02	.7983E 02	1.346	.5504E-05	.7901E-05	.6305	1.347	.5160E 03	51.483
20.0	17093	.8596E-08	.4528E-06	.2412E-01	.2509E-05	.4296E 05	.1184E-01	.1996E-02	1.000	.2551	.0668	.5239E 03	.1497E 02	.2598E 02	.8410E 02	1.346	.4489E-05	.7000E 05	.6279	1.348	.5425E 03	51.651
20.5	17094	.7553E-08	.4049E-06	.2297E-01	.2223E-05	.4851E 06	.1125E-01	.1770E-02	1.000	.2545	.0665	.5502E 03	.1504E 02	.2716E 02	.8849E 02	1.347	.4306E-05	.6226E-05	.6253	1.349	.5701E 03	51.813
21.0	17103	.6395E-08	.3560E-06	.2190E-01	.1975E-05	.5462E 06	.1071E-01															

Table I continued

$T_t = 7000^{\circ}\text{K}$ $p_t = 200$ atmospheres $\rho_t = 6.55$ atmospheres $H_t = 140.68 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.192$ $S/R_t = 34.639$

M	U	P/P_t	ρ/ρ_t	T/T_t	q/q_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9976	5318	.5605E 00	.6206E 00	.9146E 00	.3406E 00	.1000E 01	.8995E 00	.1744E 04	1.177													
2.0	9355	.1307E 00	.1898E 00	.7196E 00	.3222E 00	.1859E 01	.6889E 00	.9380E 03	1.140	.5487	.3209	.4350E 01	.3116E 01	.1332E 01	.1405E 01	1.195	.6801E 00	.6863E 00	.9845	1.200	.5206E 01	35.099
2.5	10729	.5655E-01	.9545E-01	.6326E 00	.2132E 00	.5235E 01	.5909E 00	.5411E 03	1.116	.4734	.2407	.6724E 01	.4159E 01	.1500E 01	.1652E 01	1.205	.4347E 00	.4433E 00	.9671	1.208	.7687E 01	35.638
3.0	11857	.2304E-01	.4502E-01	.5598E 00	.1228E 00	.6184E 01	.5003E 00	.2821E 03	1.089	.4238	.1935	.9597E 01	.5167E 01	.1664E 01	.1961E 01	1.215	.2460E 00	.2544E 00	.9457	1.219	.1058E 02	36.328
3.5	12802	.8919E-02	.2009E-01	.4980E 00	.4638E-01	.1283E 02	.4174E 00	.1359E 03	1.062	.3862	.1625	.1300E 02	.6154E 01	.1829E 01	.2359E 01	1.227	.1267E 00	.1333E 00	.9217	1.229	.1421E 02	37.139
4.0	13603	.3311E-02	.8584E-02	.4429E-00	.3082E-01	.2822E 02	.3423E 00	.6170E 02	1.038	.3613	.1406	.1699E 01	.7111E 01	.2004E 01	.2883E 01	1.238	.6076E-01	.6514E-01	.8961	1.240	.1835E 02	38.047
4.5	14282	.1192E-02	.3576E-02	.3903E 00	.1415E 02	.2751E 00	.2698E 02	1.018	.3404	.1245	.2179E 02	.8033E 01	.2211E 01	.3595E 01	1.248	.2779E-01	.3044E-01	.8699	1.251	.2332E 02	39.020	
5.0	14847	.4217E-02	.1493E-02	.3351E 00	.6384E-02	.1489E 03	.2165E 00	.1171E 02	1.005	.3244	.1124	.2787E 02	.8894E 01	.2502E 01	.4574E 01	1.258	.1249E-01	.1399E-01	.8442	1.260	.2962E 02	40.024
5.5	15260	.1666E-02	.7043E-03	.2816E 00	.3182E-02	.3071E 03	.1723E 00	.5679E 01	1.001	.3129	.1043	.3522E 02	.5951E 01	.2903E 01	.5751E 01	1.266	.6207E 02	.7094E 02	.8223	1.268	.3727E 02	40.907
6.0	15532	.7926E-04	.3940E-03	.2397E 00	.1844E-02	.5393E 03	.1426E 00	.3234E 01	1.000	.3058	.0991	.4291E 02	.1009E 02	.3343E 01	.6956E 01	1.272	.3589E 02	.4168E-02	.8057	1.274	.4528E 02	41.603
6.5	15730	.4174E-04	.2406E-03	.2067E 00	.1155E 02	.8721E 03	.1206E 00	1.000	.3004	.0952	.5147E 02	.1050E 02	.3811E 01	.8227E 01	1.276	.2245E 02	.2643E 02	.7917	1.278	.5379E 02	42.201	
7.0	15878	.2381E-04	.1569E-03	.1808E 00	.7676E-03	.1329E 04	.1039E 00	.1317E 01	1.000	.2961	.0923	.5953E 02	.1083E 02	.4429E 01	.9553E 01	1.280	.1490E-02	.1777E-02	.7798	1.282	.6256E 02	42.725
7.5	16001	.1400E-04	.1050E-03	.1589E 00	.5213E-03	.1966E 04	.9003E-01	.8879E 00	1.000	.2925	.0899	.6878E 02	.1113E 02	.4815E 01	.1103E 02	1.284	.1011E-02	.1219E-02	.7687	1.286	.7221E 02	43.224
8.0	16101	.8522E-05	.7223E-04	.1406E 00	.3633E-03	.2838E 04	.7861E-01	.6145E 00	1.000	.2894	.0878	.7877E 02	.1139E 02	.5372E 01	.1263E 02	1.287	.7039E-03	.8579E 03	.7585	1.289	.8260E 02	43.689
8.5	16184	.9343E-05	.5094E-04	.1250E 00	.2589E-03	.4004E 04	.6909E-01	.4356E 00	1.000	.2668	.0860	.8954E 02	.1163E 02	.5969E 01	.1437E 02	1.290	.5012E 03	.6171E-03	.7491	1.292	.9380E 02	44.127
9.0	16253	.3447E-05	.3678E-04	.1117E 00	.1885E-03	.5521E 04	.6113E-01	.3159E 00	1.000	.2844	.0844	.1011E 03	.1184E 02	.6604E 01	.1625E 02	1.293	.3648E-03	.4536E-03	.7404	1.295	.1058E 03	44.537
9.5	16311	.2285E-05	.2717E-04	.1003E 00	.1402E-03	.7453E 04	.5444E-01	.2340E 00	1.000	.2823	.0831	.1135E 03	.1204E 02	.7277E 02	.1825E 02	1.295	.2711E-03	.3401E-03	.7324	1.297	.1187E 03	44.922
10.0	16359	.1555E-05	.2048E-04	.9050E-01	.1063E-03	.9853E 04	.4880E-01	.1770E 00	1.000	.2803	.0819	.1265E 03	.1222E 02	.7984E 01	.2036E 02	1.298	.2056E 03	.2601E 03	.7251	1.299	.1322E 03	45.281
10.5	16400	.1082E-07	.1572E-04	.8203E-01	.1820E-03	.1280E 00	.4399E-01	.1362E 00	1.000	.2787	.0808	.1403E 03	.1327E 02	.8272E 02	.2259E 02	1.300	.2021E 03	.7183	1.301	.1465E 03	45.620	
11.0	16435	.7701E-06	.1228E-04	.7472E-01	.6438E-04	.1635E 05	.3990E-01	.1067E 00	1.000	.2772	.0799	.1548E 03	.1525E 02	.9498E 01	.2491E 02	1.301	.1244E 03	.1598E 03	.7121	1.303	.1616E 03	45.936
11.5	16466	.5590E-05	.9746E-05	.6836E-01	.5127E-05	.2057E 05	.3638E-01	.8479E-01	1.000	.2758	.0790	.1699E 03	.1266E 02	.1030E 02	.2732E 02	1.303	.9912E-04	.1282E-03	.7063	1.305	.1773E 03	46.233
12.0	16492	.4128E-06	.7835E-05	.6280E-01	.4134E-04	.2555E 05	.3332E 01	.6827E-01	1.000	.2746	.0782	.1856E 03	.1279E 02	.1113E 02	.2983E 02	1.305	.7993E-04	.1040E-03	.7009	1.306	.1936E 03	46.513
12.5	16514	.3095E-06	.6371E-05	.5790E-01	.3371E-04	.3137E 05	.3056E-01	.5566E-01	1.000	.2735	.0775	.2019E 03	.1290E 02	.1198E 02	.3243E 02	1.306	.6516E-04	.8532E-04	.6958	1.308	.2105E 03	46.780
13.0	16534	.2394E-06	.5236E-05	.5358E-01	.2777E-04	.3818E 05	.2831E 01	.4575E-01	1.000	.2724	.0769	.2188E 03	.1301E 02	.1286E 02	.3512E 02	1.308	.5369E-04	.7071E-04	.6910	1.309	.2281E 03	47.034
13.5	16552	.1812E-06	.4341E-05	.4974E-01	.2308E-04	.4593E 05	.2623E-01	.3797E-01	1.000	.2714	.0762	.2353E 03	.1312E 02	.1376E 02	.3791E 02	1.309	.4466E-04	.5907E-04	.6865	1.311	.2462E 03	47.277
14.0	16568	.1409E-05	.3627E-05	.4630E-01	.1932E-04	.5493E 05	.2437E 01	.3175E 01	1.000	.2705	.0757	.2544E 03	.1312E 02	.1469E 02	.4080E 02	1.310	.3734E-04	.4971E-04	.6822	1.312	.2650E 03	47.510
14.5	16582	.1107E-05	.3051E-05	.4322E-01	.1628E-04	.6524E 05	.2271E-01	.2674E-01	1.000	.2698	.0752	.2730E 03	.1330E 02	.1564E 02	.4378E 02	1.312	.3146E-04	.4210E-04	.6781	1.313	.2843E 03	47.735
15.0	16595	.8763E-07	.2583E-05	.4043E-01	.1380E-04	.7701E 05	.2121E-01	.2265E-01	1.000	.2689	.0747	.2924E 03	.1339E 02	.1663E 02	.4688E 02	1.313	.2667E-04	.3587E-04	.6742	1.314	.3044E 03	47.952
15.5	16606	.6998E-07	.2199E-05	.3791E-01	.1177E-04	.9038E 05	.1986E-01	.1930E-01	1.000	.2682	.0742	.3122E 03	.1346E 02	.1763E 02	.5006E 02	1.314	.2274E-04	.3073E-04	.6704	1.316	.3250E 03	48.162
16.0	16617	.5626E-07	.1882E-05	.3562E-01	.1008E-04	.1056E 06	.1863E-01	.1652E-01	1.000	.2673	.0737	.3330E 03	.1356E 02	.1867E 02	.5340E 02	1.315	.1949E-04	.2645E-04	.6668	1.317	.3464E 03	48.365
16.5	16626	.4551E-07	.1618E-05	.3353E-01	.8675E-05	.1270E 06	.1750E 01	.1421E 01	1.000	.2666	.0733	.3543E 03	.1364E 02	.1973E 02	.5684E 02	1.316	.1677E-04	.2286E-04	.6634	1.318	.3685E 03	48.563
17.0	16635	.3706E-07	.1397E-05	.3162E-01	.7500E-05	.1421E 06	.1647E-01	.1228E-01	1.000	.2659	.0729	.3761E 03	.1372E 02	.2082E 02	.6039E 02	1.317	.1450E-04	.1985E-04	.6600	1.319	.3912E 03	48.754
17.5	16643	.3037E-07	.1212E-05	.2987E-01	.6512E-05	.1637E 06	.1553E-01	.1066E-01	1.000	.2653	.0725	.3986E 03	.1379E 02	.2193E 02	.6405E 02	1.318	.1259E-04	.1731E-04	.6568	1.320	.4145E 03	48.941
18.0	16650	.2502E-07	.1055E-05	.2826E-01	.5676E-05	.1879E 06	.1467E-01	.9284E-01	1.000	.2647	.0721	.4218E 03	.1386E 02	.2307E 02	.6784E 02	1.319	.1097E-04	.1515E-04	.6537	1.320	.4385E 03	49.122
18.5	16657	.2071E-07	.9219E-06	.2677E-01	.4963E-05	.2150E 06	.1387E-01	.8114E-02	1.000	.2641	.0718	.4548E 03	.1393E 02	.2424E 02	.7175E 02	1.320	.9594E-05	.1330E-04	.6507	1.321	.4633E 03	49.299
19.0	16663	.1722E-07	.8082E-06	.2539E-01	.4354E-05	.2451E 06	.1313E-01	.7116E-01	1.000	.2634	.0714	.4705E 03	.1400E 02	.2544E 02	.7579E 02	1.321	.8420E 05	.1172E-04	.6478	1.322	.4889E 03	49.471
19.5	16669	.1440E-07	.7112E-06	.2413E-01	.3834E-05	.2784E 06	.1245E-01	.6264E-02	1.000	.2629	.0711	.4956E 03	.1407E 02	.2666E 02	.7995E 02	1.321	.7414E-05	.1035E-04	.6449	1.323	.5149E 03	49.640
20.0	16674	.1209E-07	.6279E-06	.2295E-01	.3139E-05	.3153E 06	.1181E-01	.5523E-02	1.000	.2624	.0708	.5214E 03	.1413E 02	.2791E 02	.8422E 02	1.322	.6549E-05	.9181E-05	.6422	1.324	.5416E 03	49.804
20.5	16679	.1020E-07	.5595E-06	.2186E-01	.3301E-05	.3362E 06	.1123E-01	.4899E-02	1.000	.2620	.0705	.5477E 03	.1418E 02	.2919E 02	.8836E 02	1.323	.5799E-05	.8158E-05	.6396	1.325	.5687E 03	49.965
21.0	16684	.8632E-08	.4935E-06	.2084E-01	.2665E-05	.4050E 06	.1068E-01	.2613	1.000	.2613</												

Table I continued

$T_t = 7000^{\circ}\text{K}$ $P_t = 500 \text{ atmospheres}$ $\rho_t = 16.87 \text{ atmospheres}$ $H_t = 132.55 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.156$ $S/R_t = 33.187$

M	U	p/p_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_t	P_{t2}/P_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_t	S/R_2	
0.9976	5245.	.5584E 00	.6220E 00	.9081E 00	.3424E 00	.1000E 01	.8962E 00	.4444E 04	1.143													
2.0	9162	.1323E 00	.1931E 00	.7154E 00	.3242E 00	.1845E 01	.6833E 00	.2409E 04	1.107	.5499	.3252	.4308E 01	.3075E 01	.1337E 01	.1414E 01	.1160	.6840E 00	.9847	1.165	.5171E 01	33.627	
2.5	10533	.5660E-01	.9875E-01	.6297E 00	.2128E 00	.3231E 01	.5815E 00	.1375E 04	1.084	.4727	.2427	.4692E 01	.4120E 01	.1503E 01	.1677E 01	.1171	.4336E 00	.9670	1.175	.7661E 01	34.160	
3.0	11659	.2275E-01	.4467E-01	.5554E 00	.1214E 00	.6266E 01	.4872E 00	.7092E 03	1.060	.4222	.1948	.9596E 01	.5133E 01	.1674E 01	.2012E 01	.1184	.2431E 00	.9453	1.187	.1059E 02	34.843	
3.5	12595	.8717E-02	.1982E-01	.4900E 00	.6290E-01	.1307E 02	.4016E 00	.3400E 03	1.037	.3870	.1638	.1306E 02	.6104E 01	.1856E 01	.2450E 01	.1197	.1246E 00	.9214	1.199	.1430E 02	35.639	
4.0	13372	.3242E-02	.8572E-02	.4296E 00	.3066E-01	.2847E 02	.3254E 00	.1561E 01	1.019	.3612	.1425	.1720E 02	.7019E 01	.2065E 01	.3031E 01	.1209	.6035E-01	.6421E-01	.8969	1.211	.1859E 02	36.513
4.5	14020	.1176E-02	.3660E-02	.3692E 00	.1439E-01	.6359E 02	.2585E 00	.6988E 02	1.036	.3414	.1270	.4223E 02	.7872E 01	.2341E 01	.3822E 01	1.221	.2819E-01	.3054E-01	.8725	1.223	.2396E 02	37.439
5.0	14511	.4547E-03	.1689E-02	.3109E 00	.7113E-02	.1331E 03	.2056E 00	.3337E 02	1.001	.3281	.1165	.2864E 02	.8587E 01	.2714E 01	.4811E 01	.1230	.1388E-01	.1530E-01	.8508	1.232	.3052E 02	38.308
5.5	14849	.2048E-03	.9000E-03	.2630E 00	.3969E-02	.2244E 03	.1683E 00	.1820E 02	1.000	.3190	.1096	.3551E 02	.9125E 01	.3146E 01	.5883E 01	.1237	.7720E-02	.8642E-02	.8334	1.239	.3770E 02	39.032
6.0	15090	.1033E-03	.5296E-03	.2254E 00	.4212E-02	.4083E 03	.1410E 00	.1088E 02	1.000	.3127	.1047	.4281E 02	.9547E 01	.3608E 01	.7023E 01	.1243	.4682E-02	.5310E-02	.8189	1.245	.4533E 02	39.652
6.5	15279	.5485E-04	.3265E-03	.1942E 00	.6545E 03	.1194E 01	.6793E 01	.1000	.3076E 01	.5096E 02	.9906E 01	.4123E 01	.8300E 01	.1248	.2953E-02	.3391E-02	.8058	1.249	.5384E 02	40.226		
7.0	15421	.3150E-04	.2142E-03	.1700E 00	.1019E-02	.9878E 03	.1029E 00	.4499E 01	1.000	.3035	.9980	.5935E 02	.1020E 02	.4646E 01	.9630E 01	.1125	.1972E-02	.2289E-02	.7945	1.254	.6260E 02	40.731
7.5	15538	.1861E-04	.1439E-03	.1494E 00	.6951E-03	.1459E 04	.3046E 01	.1000	.3002	.9955	.6856E 02	.1047E 02	.5217E 01	.1111E 02	.1255	.1344E-02	.1576E-02	.7839	1.257	.7222E 02	41.213	
8.0	15634	.1136E-04	.9941E-04	.1321E 00	.4866E-03	.2099E 04	.7793E-01	.2117E 01	1.000	.2973	.9934	.7856E 02	.1071E 02	.5828E 01	.1273E 02	.1259	.9322E-03	.1113E 02	.7741	1.261	.8266E 02	41.663
8.5	15714	.7140E-05	.5703E-04	.7031E-04	.1174E 00	.3473E-03	.2953E 04	.6848E-01	.1000	.2947	.0916	.8936E 02	.1092E 02	.6485E 01	.1449E 01	.1262	.6760E-03	.8019E 03	.7650	1.264	.9392E 02	42.088
9.0	15780	.4627E-05	.5100E 00	.1049E 00	.2540E-03	.6036E-01	.1096E 01	.1000	.2925	.9900E 02	.1100E 02	.1111E 02	.7180E 01	.1637E 02	.1265	.4902E-03	.5914E-03	.7567	1.266	.1059E 03	42.484	
9.5	15836	.3082E-05	.3782E-04	.9418E-01	.1897E-03	.5447E 04	.5403E-01	.8157E 00	1.000	.2905	.0886	.1132E 03	.1128E 02	.7917E 01	.1837E 02	1.267	.3660E-03	.4452E-03	.7490	1.269	.1188E 03	42.854
10.0	15882	.2104E-05	.2862E-04	.8498E 00	.1444E-03	.7179E 04	.4846E-01	.6190E 00	1.000	.2888	.0874	.1262E 03	.1144E 02	.8692E 01	.2049E 02	1.269	.2785E-03	.3414E-03	.7419	1.271	.1324E 03	43.201
10.5	15922	.1471E-05	.2207E-05	.7706E-01	.1119E-03	.9287E 04	.4373E-01	.4785E 00	1.000	.2871	.0863	.1400E 03	.1159E 02	.9501E 01	.2270E 02	1.272	.2158E-03	.2664E-03	.7353	1.273	.1467E 03	43.525
11.0	15955	.1052E-05	.1731E-04	.7023E-01	.8815E-04	.1181E 05	.3970E-01	.3762E 00	1.000	.2857	.0853	.1543E 03	.1172E 02	.1034E 02	.2501E 02	1.273	.1699E-03	.2112E-03	.7292	1.275	.1616E 03	43.830
11.5	15984	.7662E-06	.1378E-04	.6428E-01	.7041E-04	.1482E 05	.3632E-01	.2999E 00	1.000	.2843	.0845	.1693E 03	.1184E 02	.1121E 02	.2741E 02	1.275	.1357E-03	.1698E-03	.7235	1.277	.1771E 03	44.117
12.0	16009	.5674E-06	.1110E-04	.5907E-01	.5693E-04	.1835E 05	.3321E-01	.2421E 00	1.000	.2831	.0837	.1848E 03	.1195E 02	.1211E 02	.2991E 02	1.277	.1097E-03	.1381E-03	.7182	1.278	.1934E 03	44.390
12.5	16031	.4267E-06	.9951E-05	.5449E 05	.4653E-04	.2249E 05	.3057E-01	.1976E 00	1.000	.2821	.0829	.2099E 03	.1206E 02	.1304E 02	.3249E 02	1.278	.8967E-04	.1135E-03	.7132	1.280	.2102E 03	44.648
13.0	16050	.3251E-06	.7451E-05	.5044E 01	.3839E-04	.2279E 05	.2824E-01	.1629E 00	1.000	.2811	.0823	.2177E 03	.1216E 02	.1398E 02	.3517E 02	1.280	.7400E-04	.9423E-04	.7085	1.281	.2276E 03	44.894
13.5	16067	.2505E-06	.6183E-05	.4683E 01	.3193E-04	.3284E 05	.2618E-01	.1535E 00	1.000	.2802	.0816	.2350E 03	.1225E 02	.1498E 02	.3796E 02	1.281	.6155E-04	.7878E-04	.7040	1.283	.2457E 03	45.131
14.0	16082	.1951E-06	.5171E-05	.4361E-01	.2675E-04	.3924E-01	.2433E-01	.1132E 00	1.000	.2793	.0810	.1595E 02	.1234E 02	.1598E 02	.4084E 02	1.283	.5171E-04	.6635E-04	.6997	1.284	.2644E 03	45.357
14.5	16096	.1533E-06	.4352E-05	.4071E-01	.2255E-04	.4658E 05	.2267E-01	.9540E-01	1.000	.2785	.0805	.2716E 03	.1243E 02	.1703E 02	.4383E 02	1.284	.4348E-04	.5621E-04	.6956	1.285	.2837E 03	45.577
15.0	16108	.1219E-06	.3686E-05	.3809E 01	.1913E-04	.5495E 05	.2118E-01	.8087E-01	1.000	.2778	.0800	.2907E 03	.1250E 02	.1809E 02	.4692E 02	1.285	.3687E-04	.4789E-04	.6917	1.287	.3035E 03	45.789
15.5	16119	.9700E-07	.3139E-05	.3572E-01	.1632E-04	.6448E-01	.1982E-01	.6691E 01	1.000	.2770	.0795	.3105E 03	.1258E 02	.1919E 02	.5019E 02	1.286	.3144E-04	.4103E-04	.6879	1.288	.3242E 03	45.994
16.0	16129	.7796E-07	.2685E-05	.3356E-01	.1397E-04	.7533E-01	.1859E-01	.1000	.2762	.0790	.3311E 03	.1266E 02	.2032E 02	.5346E 02	1.287	.2694E-04	.3531E 03	.6843	1.289	.3455E 03	46.193	
16.5	16139	.6311E-07	.2309E-05	.3159E-01	.1203E-04	.8755E-01	.1747E-01	.1000	.2756	.0784	.3522E 03	.1273E 02	.2148E 02	.5690E 02	1.288	.2319E-04	.3052E-04	.6808	1.290	.3674E 03	46.386	
17.0	16147	.5142E-07	.1995E-05	.2979E-01	.1041E-04	.1013E 06	.1644E-01	.4387E-01	1.000	.2749	.0781	.3739E 03	.1280E 02	.2266E 02	.6045E 02	1.289	.2006E-04	.2652E-04	.6775	1.291	.3901E 03	46.573
17.5	16155	.4214E-07	.1731E-05	.2814E-01	.9035E-05	.1167E 06	.1590E-01	.3808E-01	1.000	.2742	.0777	.3964E 03	.1287E 02	.2388E 02	.6413E 02	1.290	.1742E-04	.2312E-04	.6742	1.292	.4134E 03	46.756
18.0	16162	.3496E-07	.1506E-05	.2662E-01	.7871E-05	.1340E 06	.1463E-01	.3316E 01	1.000	.2736	.0773	.4419E 03	.1293E 02	.2513E 02	.6794E 02	1.291	.1517E-04	.2022E-04	.6711	1.293	.4374E 03	46.934
18.5	16169	.2871E-07	.1316E-05	.2522E-01	.6882E-05	.1533E 06	.1383E-01	.2898E-01	1.000	.2729	.0769	.4434E 03	.1300E 02	.2640E 02	.7187E 02	1.292	.1327E-04	.1775E-04	.6680	1.294	.4622E 03	47.107
19.0	16175	.2389E-07	.11154E-05	.2393E-01	.6040E-05	.1748E 06	.1310E-01	.2542E-01	1.000	.2728	.0766	.4676E 03	.1305E 02	.2771E 02	.7592E 02	1.293	.1164E-04	.1563E-04	.6651	1.294	.4873E 03	47.276
19.5	16180	.1998E-07	.1016E-05	.2273E-01	.5319E-05	.1985E 06	.1242E-01	.2238E-01	1.000	.2719	.0762	.4927E 03	.1312E 02	.2904E 02	.8008E 02	1.294	.1026E-04	.1382E-04	.6622	1.295	.5134E 03	47.441
20.0	16185	.1677E-07	.8966E-06	.2163E-01	.4698E-05	.2249E 06	.1178E-01	.1976E-01	1.000	.2712	.0759	.5186E 03	.1318E 02	.3040E 02	.8438E 02	1.295	.9063E-05	.6595	1.296	.5403E 03	47.601	
20.5	16190	.1414E-07	.7937E-06	.2060E-01	.4161E-05	.2359E 06	.1120E-01	.1750E-01	1.000	.2707	.0756	.5450E 03	.1323E 02	.3179E 02	.8882E 02	1.295	.8089E-04	.6568	1.297	.5677E 03	47.758	
21.0	16195	.1197E-07	.7046E-06	.1964E-01	.3696E-05	.2280E 06	.1065E-01	.1554E-01	1.000	.2703	.0753	.5719E 03	.1329E 02	.3321E 02	.9339E 02	1.296	.7129E-05	.9708E-05	.6541	1.298	.5956E 03	47.912

Table I continued.

$T_t = 7000^\circ\text{K}$ $P_t = 1000$ atmospheres $\rho_t = 34.54$ atmospheres $H_t = 127.05 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.129$ $S/R_t = 32.141$

M	U	P/P_t	ρ/ρ_t	T/T_t	q/q_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9968	5184	.5579E 00	.6230E 00	.9054E 00	.3429E 00	.1000E 01	.8942E 00	.9006E 04	1.117													
2.0	9034	.1331E 00	.1944E 00	.7137E 00	.3249E 00	.1835E 01	.6788E 00	.4897E 04	1.084	.5501	.3269	.4285E 01	.3059E 01	.1338E 01	.1423E 01	.6857E 00	.6906E 00	.9849	.1.138	.5150E 01	32.568	
2.5	10404	.3644E-01	.9571E-01	.6266E 00	.2122E 00	.3244E 01	.5740E 00	.2777E 04	1.063	.4718	.2432	.6690E 01	.4112E 01	.1509E 01	.1698E 01	.4323E 00	.4395E 00	.9668	.1.149	.7660E 01	33.095	
3.0	11519	.2261E-01	.4434E-01	.5501E 00	.1210E 00	.5501E 01	.4778E 00	.1431E 04	1.042	.4209	.1953	.9616E 01	.5120E 01	.2051E 01	.2159	.2423E 00	.2491E 00	.9448	.1.162	.1071E 02	33.764	
3.5	12443	.8627E-02	.1980E-01	.4808E 00	.6277E-01	.1311E 02	.3906E 00	.6869E 03	1.023	.3857	.1645	.1316E 02	.6081E 01	.1887E 01	.2518E 01	.1.173	.1243E 00	.1297E 00	.9206	.1.176	.1441E 02	34.543
4.0	13202	.3211E-02	.8644E-02	.4154E 00	.3085E-01	.2830E 02	.1140E 00	.3182E 03	1.010	.3604	.1435	.1745E 02	.6966E 01	.1231E 01	.3139E 01	1.187	.6064E-01	.6425E-01	.8961	.1.189	.1888E 02	35.391
4.5	13802	.1216E-02	.3887E 02	.3523E 00	.1516E 01	.6020E 02	.2502E 00	.1496E 03	1.002	.3425	.1291	.2272E 02	.7743E 01	.2452E 01	.3947E 01	.1.199	.2965E-01	.3192E-01	.8732	.1.201	.2439E 02	36.246
5.0	14242	.5054E-03	.1926E-02	.2962E 00	.8000E-02	.1177E 03	.2017E 00	.7649E 02	1.000	.3304	.1196	.2887E 02	.8364E 01	.2856E 01	.4900E 01	1.209	.1558E-01	.1701E-01	.8537	.1.211	.3082E 02	37.021
5.5	14553	.2370E-03	.1065E-02	.2512E 00	.4619E-02	.2084E 03	.1665E 00	.4322E 02	1.000	.3223	.1131	.3556E 02	.8841E 01	.3306E 01	.5942E 01	1.217	.8966E-02	.9919E-02	.8378	.1.218	.3783E 02	37.692
6.0	14785	.1205E-03	.6321E-03	.2139E 00	.2829E-02	.3456E 03	.1397E 00	.2606E 02	1.000	.3159	.1083	.4287E 02	.9233E 01	.3798E 01	.7087E 01	1.223	.5481E-02	.6134E-02	.8240	.1.224	.4549E 02	38.292
6.5	14962	.6597E-04	.3975E-03	.1863E 00	.1822E-02	.5431E 03	.1189E 00	.1688E 02	1.000	.3114	.1047	.5075E 02	.9554E 01	.4326E 01	.8328E 01	1.228	.3524E-02	.3986E-02	.8119	.1.229	.5374E 02	38.834
7.0	15102	.3747E-02	.2601E-03	.1627E 00	.1215E-02	.8224E 03	.1023E 00	.1095E 02	1.000	.3076	.1017	.5923E 02	.9831E 01	.4889E 01	.9683E 01	.1.232	.2346E-02	.2681E-02	.8010	.1.234	.6262E 02	39.335
7.5	15217	.2218E-04	.1752E-03	.1430E 00	.6306E-03	.1212E 04	.8870E-01	.7432E 01	1.000	.3043	.0992	.6844E 02	.1008E 02	.5496E 01	.1117E 02	.1.236	.1603E-02	.1849E-02	.7910	.1.238	.7226E 02	39.805
8.0	15310	.1357E-04	.1212E-03	.1264E 00	.5819E-03	.1740E 04	.7744E-01	.5176E 01	1.000	.3016	.0972	.7842E 02	.1029E 02	.6147E 01	.1280E 02	1.240	.1122E-02	.1306E-02	.7817	.1.241	.8270E 02	40.247
8.5	15388	.8554E-05	.8604E-04	.1123E 00	.4172E-03	.2440E 04	.6808E-01	.3691E 01	1.000	.2992	.0954	.8922E 02	.1049E 02	.6845E 01	.1456E 02	1.243	.8040E-03	.9437E-03	.7731	.1.244	.9399E 02	40.661
9.0	15452	.5556E-05	.6257E-04	.1003E 00	.3059E-03	.3341E 04	.6028E-01	.2696E 01	1.000	.2970	.0938	.1008E 02	.1066E 02	.7587E 01	.1645E 02	1.246	.5894E-03	.6973E-03	.7652	.1.247	.1061E 03	41.048
9.5	15506	.3711E-05	.4656E-04	.9006E-01	.2292E-03	.4474E 04	.5374E-01	.2013E 01	1.000	.2954	.0924	.1130E 03	.1082E 02	.8369E 01	.1845E 02	1.248	.4414E-03	.5232E-03	.7578	.1.250	.1188E 03	41.409
10.0	15551	.2542E-05	.3533E-04	.8127E-01	.1749E-03	.5879E 04	.4824E-01	.1532E 01	1.000	.2939	.0912	.1260E 03	.1096E 02	.9193E 01	.2057E 02	1.251	.3367E-03	.4049E-03	.7511	.1.252	.1324E 03	41.747
10.5	15589	.1785E-05	.2723E-04	.7375E-01	.1360E-03	.7580E 04	.4357E-01	.1188E 01	1.000	.2924	.0901	.1397E 03	.1109E 02	.1005E 02	.2277E 02	1.252	.2618E-03	.3165E 03	.7448	.1.254	.1467E 03	42.062
11.0	15621	.1279E-05	.2149E-04	.6721E-01	.1074E-03	.9621E 04	.3958E-01	.9361E 00	1.000	.2910	.0892	.1539E 02	.1121E 02	.1094E 02	.2507E 02	1.255	.2067E-03	.2515E-03	.7390	.1.256	.1616E 03	42.358
11.5	15649	.9336E-06	.1714E-04	.6153E-01	.8594E-04	.1204E 05	.3613E-01	.7478E 00	1.000	.2897	.0883	.1132E 02	.1186E 02	.2747E 02	1.256	.1654E-03	.2024E-03	.7335	.1.258	.1771E 03	42.639	
12.0	15674	.6930E-06	.1384E-04	.5656E-01	.4489E 05	.3134E 01	.6047E 00	1.000	.2885	.0875	.1843E 03	.1143E 02	.1282E 02	.2595E 02	1.258	.1339E-03	.1648E-03	.7283	.1.260	.1932E 03	42.905	
12.5	15695	.5221E-06	.1130E-04	.5222E-01	.5697E-04	.1822E 05	.3052E-01	.4949E 00	1.000	.2875	.0868	.2002E 03	.1152E 02	.1308E 02	.3253E 02	1.260	.1095E-03	.1356E-03	.7235	.1.261	.2098E 03	43.158
13.0	15714	.3892E-06	.9304E-05	.4832E-01	.4704E-04	.2209E 05	.4282E-01	.4076E 00	1.000	.2865	.0861	.2169E 03	.1161E 02	.1481E 02	.3521E 02	1.261	.9045E-04	.1125E 03	.7189	.1.263	.2272E 03	43.400
13.5	15730	.3071E-06	.7727E-05	.4488E-01	.3915E-04	.2645E 05	.2614E-01	.3389E 00	1.000	.2856	.0855	.2341E 03	.1170E 02	.1585E 02	.3798E 02	1.262	.7530E-04	.9416E-04	.7145	.1.264	.2452E 03	43.632
14.0	15745	.2392E-06	.4179E-04	.3173E 05	.2430E 01	.2838E 05	.1240E 01	.2847	1.000	.2848	.0848	.2520E 03	.1179E 02	.1692E 02	.4086E 02	1.264	.6314E-04	.7934E-04	.7103	.1.265	.2639E 03	43.855
14.5	15758	.1881E-06	.5444E-05	.3902E-01	.2768E-04	.3767E 05	.2265E-01	.2392E 00	1.000	.2841	.0843	.2705E 03	.1186E 02	.1803E 02	.4385E 02	1.265	.5326E-04	.6723E-04	.7063	.1.267	.2832E 03	44.071
15.0	15770	.1491E-06	.4612E-05	.3651E-01	.2349E-04	.4441E 05	.2115E-01	.2028E 00	1.000	.2834	.0838	.2896E 03	.1194E 02	.1916E 02	.4695E 02	1.266	.4520E-04	.5732E-04	.7024	.1.268	.3031E 03	44.279
15.5	15781	.1190E-06	.3926E-05	.3423E-01	.2020E-04	.5213E 05	.1980E-01	.1728E 00	1.000	.2827	.0833	.3094E 03	.1201E 02	.2033E 02	.5017E 02	1.267	.3835E-04	.4907E 04	.6987	.1.269	.3237E 03	44.481
16.0	15791	.9570E-07	.3360E-05	.3216E-01	.1716E-04	.6088E 05	.1857E-01	.1479E 00	1.000	.2820	.0828	.3298E 03	.1208E 02	.2153E 02	.5350E 02	1.268	.3301E-04	.4222E-04	.6952	.1.270	.3450E 03	44.677
16.5	15800	.7750E-07	.2890E-05	.3028E-01	.1477E-04	.7073E 05	.1744E-01	.1273E 00	1.000	.2813	.0823	.3508E 03	.1214E 02	.2275E 02	.5694E 02	1.269	.2842E-04	.3651E 02	.6917	.1.271	.3668E 03	44.867
17.0	15809	.6315E-07	.2497E-05	.2856E-01	.1278E-04	.8183E 05	.1642E-01	.1101E 00	1.000	.2806	.0819	.3725E 03	.1221E 02	.2401E 02	.6050E 02	1.271	.2459E-04	.3171E-04	.6884	.1.272	.3894E 03	45.052
17.5	15816	.5171E-07	.2165E-05	.2697E-01	.1109E-04	.9433E 05	.1548E-01	.9347E 00	1.000	.2801	.0815	.3948E 03	.1227E 02	.2531E 02	.6419E 02	1.272	.2133E-04	.2762E-04	.6852	.1.273	.4126E 03	45.232
18.0	15823	.4258E-07	.1884E-05	.2551E-01	.9660E-05	.1083E 06	.1461E-01	.8313E 00	1.000	.2794	.0811	.4180E 03	.1233E 02	.2663E 02	.6802E 02	1.272	.1859E-04	.2416E-04	.6821	.1.274	.4367E 03	45.408
18.5	15830	.3526E-07	.1647E-05	.2417E-01	.8450E-05	.1239E 06	.1381E-01	.1000	1.000	.2790	.0807	.4414E 03	.1239E 02	.2799E 02	.7195E 02	1.273	.1626E-04	.2120E-04	.6791	.1.275	.4611E 03	45.579
19.0	15835	.2934E-07	.1445E-05	.2294E-01	.7417E-05	.1412E 06	.1307E-01	.6378E 00	1.000	.2783	.0803	.4659E 03	.1245E 02	.2937E 02	.7600E 02	1.274	.1428E-04	.1869E-04	.6762	.1.276	.4866E 03	45.744
19.5	15841	.2453E-07	.1271E-05	.2179E-01	.6531E-05	.1604E 06	.1239E-01	.5614E-01	1.000	.2779	.0800	.4907E 03	.1250E 02	.3079E 02	.8019E 02	1.275	.1257E-04	.1651E-04	.6733	.1.277	.5125E 03	45.907
20.0	15846	.2059E-07	.1122E-05	.2073E-01	.5768E-05	.1817E 06	.1176E-01	.4957E-01	1.000	.2773	.0796	.5165E 03	.1256E 02	.3223E 02	.8451E 02	1.276	.1111E-04	.1464E-04	.6706	.1.277	.5392E 03	46.065
20.5	15851	.1736E-07	.9530E-06	.1974E-01	.5109E-05	.2052E 06	.1177E-01	.4389E-01	1.000	.2768	.0793	.5427E 03	.1261E 02	.3371E 02	.8895E 02	1.277	.9834E-05	.1301E-04	.6679	.1.278	.5665E 03	46.220
21.0	15855	.1470E-07	.8816E-06	.1882E-01	.4538E-05	.2311E 06	.1062E-01	.4028E-01	1.000													

Table I continued

$T_t = 7000^{\circ}\text{K}$ $P_t = 2000 \text{ atmospheres}$ $P_t = 70.67 \text{ atmospheres}$ $H_t = 122.07 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.104$ $S/R_t = 31.137$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	P_{t2}/P_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_1	S/R_2
0.9975	5125	.5575E 00	.6233E 00	.9035E 00	.3431E 00	.1000E 01	.8924E 00	.1823E 05	1.093													
2.0	8930	.1329E 00	.1942E 00	.7105E 00	.3244E 00	.1873E 01	.6734E 00	.9895E 04	1.063	.5487	.3271	.4286E 01	.3057E 01	.1344E 01	.1433E 01	1.109	.6844E 00	.6891E 00	.9854	1.113	.5152E 01	31.556
2.5	10288	.5613E-01	.9539E-01	.6216E 00	.2115E 00	.5656E 01	.5599E 01	.4104E 05	.7049	.2434	.6701E 01	.4108E 01	.1521E 01	.1720E 01	1.121	.4308E 00	.4374E 00	.9675	1.123	.7676E 01	32.074	
3.0	11388	.2244E-01	.4445E-01	.5422E 00	.1208E 00	.6311E 01	.4687E 00	.2888E 04	.4028	.4205	.9657E 01	.5109E 01	.1712E 01	.2090E 01	1.134	.2415E 00	.2480E 00	.9455	1.137	.1076E 02	32.727	
3.5	12294	.8569E-02	.1990E-01	.4689E 00	.6301E-01	.1303E 00	.3808E 00	.1396E 04	.0103	.3857	.1652	.1328E 02	.6052E 01	.1934E 01	.2581E 01	1.149	.1246E 00	.1297E 00	.9210	1.152	.1454E 02	33.483
4.0	13022	.3242E-02	.8902E-02	.4001E 00	.3162E-01	.2756E 02	.3054E 00	.6614E 03	1.005	.3611	.1450	.1768E 02	.6899E 01	.2212E 01	.3226E 01	1.164	.6200E 01	.6555E 01	.8964	1.166	.1915E 02	34.290
4.5	13581	.1277E-02	.4186E-02	.3364E 00	.1617E-01	.5620E 02	.2445E 00	.3243E 03	1.001	.3439	.1313	.2300E 02	.7617E 01	.2568E 01	.4036E 01	1.177	.3157E-01	.3382E-01	.8739	1.179	.2472E 02	35.082
5.0	13981	.5598E-03	.2179E-02	.2835E 00	.8923E 00	.1049E 03	.1993E 00	.1738E 03	1.000	.3324	.1224	.2897E 02	.8173E 01	.2985E 01	.4958E 01	1.188	.1735E 01	.1882E 01	.8553	1.189	.3098E 02	35.791
5.5	14276	.2680E-03	.1228E-02	.2408E 00	.5244E-02	.1822E 03	.1651E 00	.1000E 03	1.000	.3242	.1160	.3559E 02	.8618E 01	.3452E 01	.5988E 01	1.196	.1016E-01	.1116E-01	.8396	1.198	.3793E 02	36.428
6.0	14502	.1367E-03	.7321E-03	.2061E 00	.3226E-02	.3009E 03	.1385E 00	.6057E 02	1.000	.3182	.1113	.4293E 02	.8985E 01	.3971E 01	.7144E 01	1.203	.6239E 02	.6920E 02	.8260	1.205	.4563E 02	37.014
6.5	14671	.7564E-04	.4666E-03	.1789E 00	.2104E-02	.4666E 03	.1183E 00	.3905E 02	1.000	.3137	.1078	.5062E 02	.9280E 01	.4513E 01	.8363E 01	1.209	.4046E-02	.4548E-02	.8145	1.210	.5371E 02	37.532
7.0	14808	.4321E-04	.3054E-03	.1561E 00	.1403E-02	.7064E 03	.1017E 00	.2580E 02	1.000	.3101	.1048	.5913E 02	.9513E 01	.5106E 01	.9732E 01	1.214	.2706E-02	.3058E-02	.8039	1.215	.6264E 02	38.024
7.5	14920	.2563E-03	.2062E-03	.1372E 00	.9617E-03	.1038E 04	.8819E-01	.1755E 02	1.000	.3071	.1024	.6835E 02	.9767E 01	.5745E 01	.1123E 02	1.218	.1853E-02	.2111E-02	.7942	1.220	.7230E 02	38.485
8.0	15011	.1569E-04	.1429E-03	.1212E 00	.6748E-03	.1489E 04	.7697E-01	.1224E 02	1.000	.3044	.1003	.7838E 02	.9968E 01	.6435E 01	.1287E 02	1.222	.1299E-02	.1492E-02	.7854	1.224	.2828E 02	38.918
8.5	15086	.9929E-05	.1018E-03	.1076E 00	.4854E-03	.2080E 04	.6770E 01	.0872E 00	1.000	.3023	.0986	.8911E 02	.1018E 02	.7170E 01	.1464E 02	1.225	.9339E-03	.1081E-02	.7773	1.227	.9406E 02	39.323
9.0	15149	.6467E-05	.7425E-04	.9614E-01	.3570E-03	.2840E 04	.5977E-01	.6417E 01	1.000	.3003	.0971	.1007E 03	.1030E 02	.7953E 01	.1653E 02	1.228	.6866E-03	.8004E-03	.7699	1.230	.1062E 03	39.700
9.5	15201	.4333E-05	.5539E-04	.8633E-01	.2681E-03	.3795E 04	.5350E-01	.4804E 01	1.000	.2987	.0957	.1129E 03	.1045E 02	.8780E 01	.1853E 02	1.231	.5154E-03	.6049E-03	.7630	1.233	.1190E 03	40.053
10.0	15245	.2977E-04	.4216E-04	.7793E-01	.2053E 00	.4971E 05	.4805E 01	.3636E 01	1.000	.2973	.0946	.1258E 03	.1057E 02	.9647E 01	.2064E 02	1.233	.3945E-03	.4659E-03	.7566	1.235	.1325E 03	40.388
10.5	15282	.2096E-05	.3270E-04	.7072E-01	.1600E-03	.6393E 04	.4343E-01	.2851E 01	1.000	.2960	.0935	.1394E 03	.1069E 02	.1055E 02	.2283E 02	1.236	.3074E-03	.3635E-03	.7507	1.237	.1467E 03	40.691
11.0	15313	.1506E-05	.2577E-04	.6449E-01	.1266E 03	.8096E 04	.3947E-01	.2251E 01	1.000	.2949	.0926	.1535E 03	.1080E 02	.1149E 02	.2513E 02	1.238	.2492E-03	.2907E 03	.7452	1.239	.1615E 03	40.981
11.5	15340	.1101E-05	.2059E-04	.5906E-01	.1015E 03	.2865E 05	.1802E 01	.2937	1.000	.2937	.0917	.1683E 03	.1090E 02	.1246E 02	.2751E 02	1.239	.1950E-03	.2343E-03	.7401	1.241	.1770E 03	41.255
12.0	15364	.8190E-06	.1665E-04	.5431E-01	.8231E-04	.1249E 05	.3308E-01	.1459E 01	1.000	.2925	.0909	.1837E 03	.1110E 02	.1346E 02	.2999E 02	1.241	.1581E-03	.1910E-03	.7352	1.243	.1931E 03	41.515
12.5	15385	.6177E-06	.1360E-04	.5013E-01	.6744E-04	.3047E 05	.1194E 01	.1400E 00	1.000	.2902	.0902	.1996E 03	.1108E 02	.1450E 02	.3256E 02	1.243	.1295E-03	.1572E-03	.7306	1.244	.2696E 03	41.763
13.0	15403	.4715E-06	.1121E-04	.4644E-01	.5573E-04	.1850E 05	.2816E-01	.9853E 00	1.000	.2907	.0896	.2162E 03	.1117E 02	.1556E 02	.2283E 02	1.244	.1070E-03	.1305E-03	.7262	1.246	.2269E 03	42.001
13.5	15419	.3640E-06	.9318E-05	.4311E-01	.4641E-04	.2224E 05	.2611E 01	.8197E 00	1.000	.2900	.0890	.2392E 03	.1124E 02	.1666E 02	.3808E 02	1.246	.8907E-04	.1092E-03	.7220	1.247	.2447E 03	42.230
14.0	15434	.2836E-06	.7798E-05	.4015E-01	.3891E-04	.2427E-01	.6866E 00	1.000	.2892	.0884	.2511E 03	.1132E 02	.1779E 02	.4049E 02	1.247	.7470E-04	.9198E-04	.7180	1.248	.2634E 03	42.450	
14.5	15447	.2331E-06	.6569E-05	.3749E-01	.3284E-04	.3149E 05	.2262E-01	.5789E 00	1.000	.2885	.0878	.2694E 03	.1139E 02	.1805E 02	.4387E 02	1.248	.6306E-04	.7799E-04	.7141	1.250	.2826E 03	42.662
15.0	15459	.1768E-06	.5569E-05	.3508E-01	.2785E 05	.3715E 01	.4907E 00	1.000	.2878	.0873	.2885E 03	.1146E 02	.2015E 02	.4698E 02	1.249	.5576E-04	.6644E-04	.7104	1.251	.3026E 03	42.868	
15.5	15469	.1412E-06	.4737E-05	.3289E-01	.2375E 04	.4386E 00	.1977E 01	.4181E 00	1.000	.2872	.0868	.3082E 03	.1152E 02	.2199E 02	.5620E 02	1.250	.4581E-04	.5688E-04	.7069	1.252	.3231E 03	43.048
16.0	15479	.1136E-06	.4035E-05	.3090E-01	.2036E 04	.5090E 05	.1854E-01	.3581E 00	1.000	.2867	.0863	.3285E 03	.1159E 02	.2263E 02	.5935E 02	1.252	.3910E-04	.4896E-04	.7034	1.253	.3449E 03	43.260
16.5	15522	.3481E-07	.3486E-05	.2910E-01	.1742E-05	.2204E-01	.8800E-05	.1181E 06	1.000	.2862	.0859	.3493E 03	.1165E 02	.2395E 02	.5698E 02	1.253	.3367E-04	.4232E-04	.7001	1.254	.3661E 03	43.448
17.0	15496	.7491E-07	.3013E-05	.2744E-01	.1516E-04	.6843E 05	.1640E-01	.2664E 00	1.000	.2856	.0854	.3710E 03	.1170E 02	.2528E 02	.6055E 02	1.254	.2911E-04	.3673E-04	.6969	1.255	.3886E 03	43.630
17.5	15503	.6133E-07	.2612E-05	.2591E-01	.1325E-04	.7889E 05	.1545E-01	.2311E 00	1.000	.2851	.0850	.3933E 03	.1176E 02	.2665E 02	.6426E 02	1.255	.2526E-04	.3199E-04	.6928	1.256	.4119E 03	43.808
18.0	15510	.5055E-07	.2274E-05	.2452E-01	.1146E-04	.9058E 05	.1458E-01	.2012E 00	1.000	.2846	.0846	.4162E 03	.1182E 02	.2805E 02	.6808E 02	1.256	.2201E-04	.2768E-04	.6907	1.257	.4537E 03	43.981
18.5	15516	.4183E-07	.1998E-05	.2232E-01	.1038E-04	.1036E 06	.1379E-01	.1760E-00	1.000	.2840	.0842	.4398E 03	.1187E 02	.2948E 02	.7202E 02	1.257	.1926E-04	.2457E-04	.6878	1.258	.4604E 03	44.149
19.0	15522	.3481E-07	.1747E-05	.2170E 06	.1009E-01	.1742E-01	.8800E-05	.1181E 06	1.000	.2835	.0839	.4640E 03	.1192E 02	.3095E 02	.7609E 02	1.257	.1691E-04	.2164E-04	.6850	1.259	.4856E 03	44.314
19.5	15528	.2910E-07	.1534E-05	.2094E-01	.7748E-05	.1341E 06	.1237E-01	.1359E 00	1.000	.2829	.0835	.4889E 03	.1198E 02	.3244E 02	.8029E 02	1.258	.1489E-04	.1912E-04	.6822	1.260	.5116E 03	44.474
20.0	15533	.2443E-07	.1354E-05	.1992E-01	.6843E-05	.1519E 06	.1174E-01	.1200E 00	1.000	.2824	.0832	.5144E 03	.1202E 02	.3398E 02	.8463E 02	1.259	.1315E-04	.1694E-04	.6795	1.261	.5382E 03	44.630
20.5	15537	.2060E-07	.1198E-05	.1897E-01	.6061E-05	.1716E 06	.1115E-01	.1062E 00	1.000	.2819	.0828	.5407E 03	.1207E 02	.3554E 02	.8810E 02	1.260	.1165E-04	.1505E-04	.6769	1.261	.5656E 03	44.783
21.0	15542	.1743E-07	.1064E-05	.1809E-01	.5384E-05	.1932E 06	.1060E-01	.9434E-01	1.000</td													

Table I continued

$T_t = 8000^{\circ}\text{K}$ $P_t = 200 \text{ atmospheres}$ $\rho_t = 5.37 \text{ atmospheres}$ $H_t = 182.13 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.272$ $S/R_t = 36.425$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9991	5834	5667E-00	6194E-00	9306E-00	3354E-00	1000E-01	9066E-00	1566E-04	1.250													
2.0	10450	1303E-00	1805E-00	7623E-00	3137E-00	1915E-01	7002E-00	8175E-03	1.204	5381	3076	4333E-01	3251E-01	1260E-01	1388E-01	1.274	6695E-00	6779E-00	9806	1.281	5137E-01	36.938
2.5	12156	5175E-01	8449E-01	6594E-00	1986E-00	3518E-01	5943E-00	4450E-02	1.181	4581	2239	6957E-01	4467E-01	1430E-01	1648E-01	1.286	4072E-00	4189E-00	9570	1.291	7867E-01	37.576
3.0	13392	2123E-01	4099E-01	5686E-00	1170E-00	6582E-01	5076E-00	2379E-03	1.158	4126	1812	1002E-02	5518E-01	1621E-01	1938E-01	1.298	2350E-00	2462E-00	9319	1.302	1107E-02	38.288
3.5	14328	8994E-02	2016E-01	5010E-00	6586E-01	1251E-02	4363E-00	1252E-03	1.132	3817	1550	1337E-01	6451E-01	1792E-01	2261E-01	1.310	1309E-00	1399E-00	9062	1.313	1455E-02	39.052
4.0	15123	3673E-02	9450E-02	4478E-00	3439E-01	2528E-02	3721E-00	6193E-02	1.104	3569	1356	1719E-02	7373E-01	1947E-01	2657E-01	1.321	6796E-01	7425E-01	8785	1.325	1850E-02	39.916
4.5	15823	1426E-02	4184E-02	4031E-00	1667E-01	5456E-02	3126E-00	2869E-02	1.075	3365	1204	2156E-02	8305E-01	2093E-01	3167E-01	1.333	3281E-01	3677E-01	8492	1.336	2302E-02	40.984
5.0	16438	5306E-03	1773E-02	3632E-00	7621E-02	1240E-03	2582E-00	1263E-02	1.048	3191	1082	2662E-02	9244E-01	2243E-01	3840E-01	1.345	1497E-01	1724E-01	8191	1.348	2822E-02	41.936
5.5	16970	1935E-03	7375E-03	3255E-02	3379E-02	2887E-03	2093E-00	5423E-01	1.025	3045	0984	3249E-02	1017E-02	2414E-01	4741E-01	1.357	6627E-02	7854E-02	7894	1.359	3425E-02	43.039
6.0	17431	6895E-04	3047E-03	2854E-00	1473E-02	5604E-03	2301E-00	1.008	2921	0903	3985E-02	1107E-02	2655E-01	5990E-01	1.367	2809E-02	3520E-02	7607	1.370	4183E-02	44.173	
6.5	17791	2625E-04	1377E-03	2421E-00	6933E-03	1475E-04	1310E-00	1062E-01	1.001	2828	0844	4936E-02	1185E-02	3029E-01	7585E-01	1.376	1356E-02	1699E-02	7360	1.379	5164E-02	45.210
7.0	18014	1281E-04	7832E-04	2079E-00	4043E-03	2561E-04	1091E-00	6113E-00	1.000	2768	0807	5905E-02	1239E-02	3447E-01	9112E-01	1.383	7895E-03	1008E-02	7191	1.385	6165E-02	45.957
7.5	18171	7087E-05	4966E-04	1815E-00	2609E-03	4040E-04	9348E-01	3910E-00	1.000	2727	0781	6885E-02	1280E-02	3877E-01	1064E-02	1.387	5089E-03	6598E-03	7058	1.389	7180E-02	46.565
8.0	18289	4260E-05	3370E-04	1607E-00	1794E-03	5862E-04	8167E-01	2671E-00	1.000	2694	0761	7877E-02	1314E-02	4310E-01	1218E-02	1.391	3495E-03	4592E-03	6948	1.393	8205E-02	47.088
8.5	18387	2640E-05	2345E-04	1432E-00	1261E-03	8381E-04	7181E-01	1868E-00	1.000	2665	0744	8943E-02	1344E-02	4769E-01	1385E-02	1.395	2457E-03	3267E-03	6846	1.397	9307E-02	47.579
9.0	18469	1683E-05	1369E-04	1282E-00	9060E-04	1172E-05	1336E-00	1.000	2641	0729	1008E-03	1372E-02	5255E-01	1566E-02	1.398	1764E-03	2372E-03	6753	1.400	1048E-03	48.042	
9.5	18538	1100E-05	1214E-04	1152E-00	6638E-04	1606E-05	5655E-02	9752E-01	1.000	2617	0715	1130E-03	1398E-02	5771E-01	1761E-02	1.401	1292E-03	1756E-03	6668	1.403	1174E-03	48.478
10.0	18596	7352E-05	8989E-05	1040E-00	4946E-04	2162E-05	5053E-01	7243E-01	1.000	2597	0704	1260E-03	1421E-02	6318E-01	1970E-02	1.404	9623E-04	1321E-03	6589	1.406	1309E-03	48.892
10.5	18646	5035E-06	6789E-05	9429E-01	3756E-04	2854E-05	4549E-01	5485E-01	1.000	2579	0693	1398E-03	1442E-02	6893E-01	2191E-02	1.406	7306E-04	1013E-03	6516	1.408	1451E-03	49.279
11.0	18689	3518E-06	5213E-05	8580E-01	2897E-04	3709E-05	4106E-01	4222E-01	1.000	2563	0684	1544E-02	1462E-02	7479E-01	2425E-02	1.409	5633E-04	7875E-04	6448	1.411	1601E-03	49.646
11.5	18726	2510E-06	4071E-05	7840E-01	2271E-04	4740E-05	3732E-01	3304E-01	1.000	2547	0676	1697E-03	1480E-02	8126E-01	2669E-02	1.411	4417E-04	6226E-04	6386	1.413	1760E-03	49.989
12.0	18757	1823E-06	3224E-05	7188E-01	1805E-04	5976E-05	3404E-01	2620E-01	1.000	2534	0668	1857E-03	1497E-02	8784E-01	2925E-02	1.413	3508E-04	4982E-04	6329	1.415	1925E-03	50.316
12.5	18785	1347E-06	2589E-05	6617E-01	1454E-04	7249E-05	3121E-01	2108E-01	1.000	2522	0661	2024E-03	1512E-02	9463E-01	3191E-02	1.415	2825E-04	4042E-04	6276	1.416	2097E-03	50.622
13.0	18809	1012E-06	2106E-05	6113E-01	1185E-04	9124E-05	2874E-01	1716E-01	1.000	2511	0655	2198E-03	1527E-02	1016E-02	3465E-02	1.416	2304E-04	3318E-04	6226	1.418	2276E-03	50.912
13.5	18830	7710E-07	1713E-05	5656E-01	9763E-05	1109E-05	2656E-01	1412E-01	1.000	2500	0649	2378E-03	1514E-02	1088E-02	3749E-02	1.418	1898E-04	2751E-04	6180	1.420	2462E-03	51.187
14.0	18848	5947E-07	1436E-05	5266E-01	8117E-05	1335E-06	3800E-01	2464E-01	1.000	2501	0644	2564E-03	1517E-02	11763E-01	3027E-02	1.421	1578E-04	2301E-04	6136	1.421	2655E-03	51.449
14.5	18865	4646E-07	1202E-05	4910E-01	6005E-05	1594E-06	2293E-01	9625E-02	1.000	2482	0639	2755E-03	1565E-02	1239E-02	4344E-02	1.421	1323E-04	1940E-04	6094	1.423	2851E-03	51.700
15.0	18880	3636E-07	1014E-05	4590E-01	5747E-05	1888E-06	2140E-02	8292E-02	1.000	2474	0634	2939E-03	1577E-02	1317E-02	4655E-02	1.422	11648E-04	6055	1.424	3054E-03	51.800	
15.5	18893	2910E-07	8605E-05	4301E-01	4887E-05	2222E-06	2020E-02	7045E-02	1.000	2466	0630	3156E-03	1587E-02	1397E-02	4949E-02	1.424	1408E-04	6018	1.425	3264E-03	52.171	
16.0	18905	2334E-07	7349E-06	4039E-01	4179E-05	2601E-06	1877E-01	6020E-02	1.000	2458	0626	3366E-03	1598E-02	1478E-02	5308E-02	1.425	8123E-05	5983	1.426	3481E-03	52.394	
16.5	18916	1886E-07	6311E-06	3800E-01	3593E-05	3027E-06	1763E-01	5027E-02	1.000	2451	0622	3582E-03	1608E-02	1562E-02	5684E-02	1.426	1046E-04	5949	1.427	3703E-03	52.610	
17.0	18926	1534E-07	5445E-06	3582E-01	3103E-05	3507E-06	1660E-01	4465E-02	1.000	2445	0618	3804E-03	1617E-02	1648E-02	6001E-02	1.427	6030E-05	9739E-05	5916	1.429	3931E-03	52.820
17.5	18925	1256E-07	4720E-06	3384E-01	3201E-05	3572E-06	1629E-01	4043E-02	1.000	2438	0615	4038E-03	1627E-02	1736E-02	6364E-02	1.428	5234E-05	7910E-05	5885	1.430	4167E-03	53.022
18.0	18943	1094E-07	4108E-06	3201E-01	3245E-05	4643E-06	1479E-01	3372E-02	1.000	2432	0612	4266E-03	1635E-02	1826E-02	6738E-02	1.429	4558E-05	6919E-05	5885	1.431	4407E-03	53.220
18.5	18951	8559E-08	3988E-07	3032E-01	2050E-05	5315E-06	1399E-01	2946E-02	1.000	2426	0608	4509E-03	1644E-02	1918E-02	7124E-02	1.430	3985E-05	6076E-05	5826	1.432	4585E-03	53.412
19.0	18958	7141E-08	3145E-06	2876E-01	1798E-05	6061E-06	1325E-01	2525E-02	1.000	2420	0605	4758E-03	1653E-02	2012E-02	7522E-02	1.431	3496E-05	5352E-05	5798	1.433	4914E-03	53.599
19.5	18965	5947E-08	2767E-06	2733E-01	1583E-05	6886E-06	1256E-02	2274E-02	1.000	2414	0602	5013E-03	1661E-02	2108E-02	7139E-02	1.432	3079E-05	4732E-05	5771	1.433	5177E-05	53.782
20.0	18971	4995E-08	2443E-06	2600E-01	1399E-05	6796E-06	1153E-01	2008E-02	1.000	2404	0599	5275E-03	1669E-02	2206E-02	8350E-02	1.433	2727E-05	4198E-05	5745	1.434	5446E-03	54.539
20.5	18976	4212E-08	2163E-06	2307E-01	1293E-05	6803E-06	1135E-01	1779E-02	1.000	2403	0596	5343E-03	1677E-02	2306E-02	8782E-02	1.434	3734E-05	5720	1.435	5722E-03	54.123	
21.0	18982	3565E-08	1920E-06	2361E-01	1101E-05	5991E-06	1190E-01	1579E-02	1.000	2398												

Table I continued

$T_t = 8000^\circ K$ $p_t = 500$ atmospheres $\rho_t = 14.00$ atmospheres $H_t = 166.30 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.219$ $S/R_t = 34.645$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_t	S/R_{t2}
0.9981	5732	.5630E 00	.6201E 00	.9209E 00	.3383E 00	.1000E 01	.9012E 00	.4018E 04	1.201													
2.0	10174	.1295E 00	.1852E 00	.7325E 00	.3182E 00	.1887E 01	.6887E 00	.2129E 04	1.164	.5433	.3148	.4368E 01	.3176E 01	.1308E 01	.1407E 01	1.223	.6737E 00	.6808E 00	.9818	1.228	.5204E 01	35.127
2.5	11729	.5371E-01	.9062E-01	.6329E 00	.3345E 00	.5864E 01	.1201E 04	1.141	.4675	.2338	.6903E 01	.4277E 01	.1492E 01	.1667E 01	1.235	.4221E 00	.4321E 00	.9608	1.239	.7859E 01	35.104	
3.0	12885	.2272E-01	.4475E-01	.5562E 00	.2233E 00	.6165E 01	.5008E 00	.6517E 03	1.116	.4220	.1904	.9790E 01	.5252E 01	.1669E 01	.1961E 01	1.247	.2470E 00	.2568E 00	.9374	1.251	.1087E 02	36.704
3.5	13842	.1923E-02	.2108E-01	.4902E 00	.6704E-01	.1218E 02	.4239E 00	.3298E 03	1.050	.3883	.1615	.1317E 02	.6193E 01	.1839E 01	.2324E 01	1.260	.1329E 02	.1407E 00	.9114	1.263	.1439E 02	37.148
4.0	14652	.3618E-02	.9499E-02	.4367E 00	.3385E-01	.2554E 02	.3545E 00	.1573E 03	1.063	.3628	.1406	.1708E 02	.7114E 01	.2005E 01	.2785E 01	1.273	.6672E-01	.7214E-01	.8835	1.276	.1844E 02	38.022
4.5	15345	.1370E-02	.4128E-02	.3893E 00	.1614E-01	.5611E 02	.2920E 00	.7160E 02	1.039	.3417	.1248	.2162E 02	.8019E 01	.2179E 01	.3387E 01	1.286	.3169E-01	.3507E-01	.8547	1.288	.2313E 02	38.976
5.0	15938	.5073E-03	.1761E-02	.3446E 00	.7427E-02	.1266E 03	.2362E 00	.3173E 02	1.019	.3245	.1124	.2698E 02	.8894E 01	.2382E 01	.4192E 01	1.298	.1455E-01	.1651E-01	.8259	1.300	.2869E 02	39.983
5.5	16437	.1859E-03	.7554E-03	.2982E 00	.2886E-02	.2863E 03	.1877E 00	.1403E 02	1.006	.3109	.1028	.3707E 02	.9726E 01	.2662E 01	.5283E 01	1.309	.6522E-02	.7712E-02	.7981	1.311	.3563E 02	41.011
6.0	16812	.7450E-04	.3594E-03	.2524E 00	.1686E-02	.5884E 03	.1501E 00	.6828E 01	1.001	.3007	.0959	.4192E 02	.1042E 02	.3053E 01	.6609E 01	1.318	.3289E-02	.3920E-02	.7743	1.321	.4415E 02	41.931
6.5	17060	.3611E-04	.2035E-03	.2162E 00	.9831E-03	.1024E 04	.1249E 00	.3924E 01	1.000	.2940	.0914	.5047E 02	.1094E 02	.3484E 01	.7946E 01	1.325	.1914E-02	.2324E-02	.7567	1.327	.5902E 02	42.647
7.0	17237	.1964E-04	.1272E-03	.1882E 00	.6272E-03	.1622E 00	.1066E 01	.2477E 00	1.000	.2893	.0982	.5923E 02	.1133E 02	.3928E 01	.9314E 01	1.330	.1220E-02	.1503E-02	.7424	1.332	.6213E 02	43.246
7.5	17376	.1131E-04	.8347E-04	.1651E 00	.4184E-04	.9214E-04	.1639E 01	.1000	.2853	.0856	.6865E 02	.1168E 02	.4404E 01	.1078E 01	1.335	.8129E-03	.1015E-03	.7299	1.337	.7190E 02	43.787	
8.0	17487	.6853E-05	.5705E-05	.1463E 00	.2898E-03	.3561E 00	.8057E-01	.1128E 01	1.000	.2820	.0835	.7849E 02	.1198E 02	.4894E 01	.1233E 01	1.339	.5627E-03	.7116E-03	.7188	1.341	.8211E 02	44.279
8.5	17579	.2467E-05	.3992E-04	.1303E 00	.2048E-03	.5066E 04	.7085E 01	.7931E 00	1.000	.2791	.0816	.8913E 02	.1225E 02	.5420E 02	.1404E 02	1.343	.3974E-03	.5084E 03	.7085	1.345	.9312E 02	44.746
9.0	17656	.2732E-05	.2857E-04	.1166E 00	.1478E-03	.7048E 04	.6267E-01	.5700E 00	1.000	.2764	.0800	.1005E 03	.1250E 02	.5978E 01	.1586E 02	1.346	.2868E-03	.3709E-03	.6991	1.348	.1050E 03	45.185
9.5	17721	.1790E-05	.2084E-04	.1047E 00	.1086E-03	.9625E 04	.5573E-01	.4174E 00	1.000	.2742	.0786	.1128E 02	.1272E 02	.6573E 01	.1784E 02	1.349	.2107E-03	.2753E-03	.6904	1.351	.1177E 03	45.600
10.0	17776	.1205E-05	.1554E-04	.9450E 00	.1815E-04	.1287E 00	.3098E-01	.9498E-01	1.000	.2722	.0773	.1258E 03	.1293E 02	.7198E 01	.1594E 02	1.352	.1580E-03	.2085E 03	.6824	1.354	.1312E 03	45.989
10.5	17823	.8287E-06	.1180E-05	.8563E 01	.6220E-05	.1691E 05	.4487E-01	.2376E 00	1.000	.2705	.0762	.1395E 03	.1311E 02	.7858E 01	.2216E 02	1.355	.1205E-03	.1605E 03	.6750	1.356	.1455E 03	46.356
11.0	17863	.5832E-06	.9118E-05	.7795E-01	.4829E-05	.2183E 05	.4606E 01	.1841E 00	1.000	.2687	.0752	.1541E 03	.1529E 02	.8546E 01	.2450E 02	1.357	.9360E-04	.1256E 02	.6682	1.359	.1605E 03	46.699
11.5	17897	.4181E-06	.7155E-05	.7122E-01	.3804E-04	.2776E 05	.3691E-01	.1447E 00	1.000	.2671	.0743	.1694E 03	.1345E 02	.9266E 02	.2695E 02	1.359	.7973E-04	.9977E-04	.6619	1.361	.1764E 03	47.024
12.0	17926	.3057E-06	.5702E-05	.6535E-01	.3042E-04	.3747E 00	.3374E-01	.1155E 00	1.000	.2659	.0735	.1853E 03	.1360E 02	.1001E 02	.2949E 02	1.361	.5893E-04	.8033E-04	.6560	1.363	.1928E 03	47.329
12.5	17952	.2273E-06	.4640E-05	.6019E-01	.2463E-05	.4302E 05	.3098E-01	.9340E-01	1.000	.2646	.0728	.2019E 03	.1374E 02	.1078E 02	.3212E 02	1.363	.4773E-04	.6552E-04	.6506	1.365	.2099E 03	47.616
13.0	17974	.1716E-06	.3759E-05	.5564E-01	.2016E-05	.5261E 05	.2856E-01	.7636E 01	1.000	.2635	.0721	.2190E 03	.1387E 02	.1157E 02	.3484E 02	1.365	.3907E-04	.5397E-04	.6455	1.367	.2277E 03	47.889
13.5	17994	.1312E-06	.3100E-05	.5159E-01	.1636E-05	.6372E 05	.2642E-01	.6305E-01	1.000	.2625	.0715	.2367E 03	.1399E 02	.1239E 02	.3766E 02	1.367	.3228E-04	.4484E-04	.6407	1.368	.2460E 03	48.150
14.0	18012	.1016E-06	.2581E-05	.4799E-01	.1390E-04	.5253E-01	.1764E 00	.2453E 01	1.000	.2614	.0709	.2551E 03	.1410E 02	.1322E 02	.4057E 02	1.368	.2692E-04	.3765E-04	.6362	1.370	.2649E 03	48.399
14.5	18027	.7955E-07	.2166E-05	.4477E-01	.1168E-04	.9105E 04	.2284E-01	.4412E 01	1.000	.2604	.0704	.2740E 03	.1421E 02	.1408E 02	.4357E 02	1.369	.2253E-04	.3182E-04	.6320	1.371	.2844E 04	48.638
15.0	18041	.6284E-07	.1830E-05	.4186E-01	.9885E-06	.1077E 06	.2132E-01	.3730E-01	1.000	.2595	.0699	.2935E 03	.1431E 02	.1496E 02	.4667E 02	1.371	.1915E-04	.2708E-04	.6279	1.373	.3047E 03	48.867
15.5	18054	.5007E-07	.1555E-05	.3924E-01	.8415E-05	.1266E 05	.1996E-01	.3179E-01	1.000	.2587	.0694	.3137E 03	.1441E 02	.1587E 02	.4988E 02	1.372	.1630E-04	.2317E-04	.6241	1.374	.3256E 03	49.089
16.0	18065	.4021E-07	.1330E-05	.3686E-01	.7203E-05	.1480E 06	.1872E-01	.2715E-01	1.000	.2579	.0689	.3345E 03	.1451E 02	.1679E 02	.5318E 02	1.373	.1396E-04	.2199E-04	.6204	1.375	.3472E 03	49.302
16.5	18076	.3252E-07	.1143E-05	.3469E-01	.6196E-05	.1721E 06	.1759E-01	.2334E-01	1.000	.2573	.0685	.3559E 03	.1459E 02	.1774E 02	.5660E 02	1.375	.1201E-04	.1724E-04	.6169	1.376	.3692E 03	49.509
17.0	18085	.2648E-07	.9866E-06	.3271E-01	.5356E-05	.1919E 06	.1656E-01	.2016E-01	1.000	.2565	.0681	.3780E 03	.1468E 02	.1871E 02	.6011E 02	1.376	.1038E-04	.1497E-04	.6135	1.377	.3921E 03	49.709
17.5	18094	.2168E-07	.8552E-06	.3089E 00	.4648E-05	.2297E 06	.1561E-01	.1749E-01	1.000	.2559	.0677	.4007E 03	.1477E 02	.1971E 02	.6376E 02	1.377	.9006E-05	.1305E-05	.6102	1.379	.4155E 03	49.905
18.0	18102	.1784E-07	.7442E-07	.2922E-01	.4048E-05	.2629E 05	.1474E-01	.1523E-01	1.000	.2552	.0673	.4242E 03	.1485E 02	.2073E 02	.6752E 02	1.378	.7846E-05	.1142E-04	.6070	1.380	.4398E 03	50.095
18.5	18109	.1477E-07	.6503E-06	.2768E-01	.3534E-05	.3019E 06	.1394E-01	.1331E-01	1.000	.2546	.0670	.4648E 03	.1493E 02	.2177E 02	.7139E 02	1.379	.6860E-05	.1003E-04	.6040	1.381	.4645E 03	50.281
19.0	18116	.1229E-07	.5704E-06	.2627E-01	.3107E-05	.3440E 06	.1321E-01	.1160E 01	1.000	.2540	.0667	.4726E 03	.1500E 02	.2283E 02	.7537E 02	1.380	.6021E-05	.8837E-05	.6011	1.382	.4899E 03	50.461
19.5	18122	.1028E-07	.5020E-06	.2496E-01	.2736E-05	.3908E 06	.1253E-01	.1028E-01	1.000	.2534	.0663	.4980E 03	.1508E 02	.2392E 02	.7947E 02	1.381	.5303E-05	.7814E-05	.5982	1.383	.5160E 03	50.636
20.0	18128	.8627E-07	.4429E-06	.2374E-01	.2416E-05	.4427E 06	.1189E-01	.9075E-02	1.000	.2528	.0660	.5241E 03	.1515E 02	.2503E 02	.8371E 02	1.382	.4684E-05	.6292E-05	.5955	1.384	.5429E 03	50.808
20.5	18133	.7270E-08	.3920E-06	.2240E-01	.5001E-05	.6011E 01	.1131E-01	.8039E-02	1.000	.2523	.0657	.5507E 03	.1522E 02	.2617E 02	.8808E 02	1.383	.4146E-05	.6158E-05	.5928	1.384	.5703E 03	50.977
21.0	18138	.6154E-08	.3480E-06	.2155E-01	.1901E-05	.3631E 06	.1076															

Table I continued

$T_t = 8000^{\circ}\text{K}$ $P_t = 1000 \text{ atmospheres}$ $\rho_t = 28.83 \text{ atmospheres}$ $H_t = 156.97 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.184$ $S/R_t = 33.435$

M	U	ρ/ρ_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	ρ_{t2}/ρ_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	ρ_{t2}/ρ_t	S/R_2	
0.9975	5662	.5603E 00	.6208E 00	.9141E 00	.3402E 00	.1000E 01	.8979E 00	.8181E 04	1.169													
2.0	9970	.1303E 00	.1891E 00	.7189E 00	.3213E 00	.1864E 01	.6834E 00	.4388E 04	1.134	.5475	.3205	.4351E 01	.3121E 01	.1331E 01	.1416E 01	1.189	.6786E 00	.6847E 00	.9827	1.194	.5208E 01	33.895
2.5	11462	.5613E-01	.9289E-01	.6244E-01	.2110E-01	.3262E-01	.5818E-01	.2507E-04	1.112	.4738	.2394	.6822E-01	.4177E-01	.1512E-01	.1674E-01	1.201	.4298E-00	.4385E-00	.9628	1.205	.7796E-01	34.442
3.0	12619	.2294E-01	.4560E-01	.5475E-01	.1241E-01	.6109E-01	.4928E-01	.1339E-04	1.086	.4247	.1942	.9716E-01	.5149E-01	.1690E-01	.1990E-01	1.214	.2482E-00	.9396	1.218	.1082E-02	35.106	
3.5	13574	.9186E-02	.2116E-01	.4833E-01	.6665E-01	.1224E-02	.4131E-01	.1063	.3904	.1645	.1312E-02	.6080E-01	.1868E-01	.2382E-01	1.228	.1320E-02	.1388E-01	.9138	1.231	.1437E-02	35.879	
4.0	14379	.3546E-02	.9438E-02	.4275E-00	.3335E-01	.2590E-02	.3141E-00	.3159E-03	1.040	.3644	.1432	.1712E-02	.6981E-01	.2053E-01	.2890E-01	1.242	.6565E-01	.7041E-01	.8865	1.245	.1852E-02	36.743
4.5	15055	.1341E-02	.4129E-02	.3756E-00	.1599E-01	.5655E-02	.2780E-00	.1021	.3443	.1275	.2180E-02	.7840E-01	.2226E-01	.3555E-01	1.256	.3135E-01	.8589	1.258	.2338E-02	37.667		
5.0	15626	.4460E-03	.1787E-02	.3241E-00	.7459E-02	.1259E-03	.2222E-00	.6500E-02	1.007	.3281	.1154	.2760E-02	.8662E-01	.2532E-01	.4453E-01	1.268	.1458E-01	.1634E-01	.8314	1.270	.2939E-02	38.635
5.5	16065	.1956E-03	.8345E-03	.2770E-00	.3681E-02	.2622E-03	.1778E-00	.3120E-02	1.001	.3161	.1067	.3462E-02	.9368E-01	.2895E-01	.5570E-02	1.278	.7175E-02	.8218E-02	.8070	1.281	.3669E-02	39.539
6.0	16371	.8960E-04	.4495E-03	.2359E-00	.2059E-02	.4776E-03	.1463E-00	.1713E-02	1.000	.3079	.1009	.4232E-02	.9911E-01	.3320E-02	.5776E-01	1.286	.4005E-02	.4671E-02	.7875	1.289	.4470E-02	40.287
6.5	16588	.4625E-04	.2689E-03	.2035E-00	.1265E-02	.7879E-03	.1235E-00	.1038E-02	1.000	.3018	.0967	.5040E-02	.1034E-02	.3771E-01	.8033E-01	1.293	.2457E-02	.2910E-02	.7717	1.295	.5312E-02	40.918
7.0	16760	.2515E-04	.1686E-03	.1766E-00	.8093E-03	.1244E-04	.1052E-00	.6575E-01	1.000	.2972	.0934	.5933E-02	.1071E-02	.4268E-01	.9428E-01	1.298	.3135E-02	.1886E-02	.7576	1.300	.6242E-02	41.499
7.5	16888	.1488E-04	.1131E-03	.1558E-00	.5512E-03	.1841E-04	.9153E-01	.4445E-01	1.000	.2934	.0908	.6834E-02	.1101E-02	.4765E-02	.1084E-02	1.303	.1069E-02	.1300E-02	.7457	1.305	.7179E-02	41.999
8.0	16995	.8997E-05	.7726E-04	.1378E-00	.3814E-03	.2677E-04	.7990E-01	.3056E-01	1.000	.2901	.0886	.7825E-02	.1126E-02	.5306E-01	.1243E-02	1.307	.7386E-03	.9093E-03	.7345	1.309	.820E-02	42.482
8.5	17084	.5615E-05	.1227E-04	.2703E-00	.3797E-04	.7024E-01	.2155E-00	.1000	.2872	.0867	.8890E-02	.1152E-02	.5880E-01	.1414E-02	1.311	.5232E-03	.6513E-03	.7243	1.313	.9317E-02	42.933	
9.0	17159	.3601E-05	.1097E-00	.1956E-03	.5271E-04	.6212E-01	.1552E-01	1.000	.2846	.0850	.1004E-03	.1176E-02	.6492E-01	.1599E-02	1.314	.3785E-03	.4761E-03	.7149	1.316	.1051E-03	43.359	
9.5	17221	.2370E-05	.2848E-04	.9851E-01	.1444E-03	.7176E-04	.5527E-01	.1141E-01	1.000	.2823	.0835	.1126E-03	.1197E-02	.7141E-01	.1797E-02	1.318	.2793E-03	.3548E-03	.7576	1.319	.1178E-03	43.759
10.0	17274	.1599E-05	.2130E-04	.8889E-01	.1086E-03	.9554E-04	.4947E-01	.8563E-01	1.000	.2804	.0823	.1256E-03	.1216E-02	.7826E-01	.2008E-02	1.320	.2101E-03	.2693E-03	.6982	1.322	.1313E-03	44.135
10.5	17319	.1106E-05	.1625E-04	.8058E-01	.8329E-04	.1249E-05	.4455E-01	.5648E-00	1.000	.2785	.0811	.1394E-03	.1233E-02	.8543E-01	.2230E-02	1.323	.1611E-03	.2083E-03	.6909	1.325	.1456E-03	44.486
11.0	17357	.7802E-06	.1259E-04	.7333E-01	.6485E-03	.1606E-05	.4033E-01	.5087E-00	1.000	.2770	.0801	.1539E-03	.1249E-02	.9295E-01	.2464E-02	1.326	.1634E-03	.6841	1.327	.1607E-03	44.818	
11.5	17390	.5621E-06	.9924E-05	.6704E-01	.5129E-04	.2037E-05	.3671E-01	.4017E-00	1.000	.2755	.0791	.1691E-03	.1264E-02	.1008E-02	.2707E-02	1.328	.9918E-04	.1303E-03	.6778	1.330	.1765E-03	45.130
12.0	17418	.4126E-06	.7936E-05	.6151E-01	.4115E-04	.2543E-05	.3358E-01	.3217E-00	1.000	.2741	.0783	.1848E-03	.1277E-02	.1088E-02	.2961E-02	1.330	.7955E-03	.1052E-03	.6719	1.332	.1928E-03	45.423
12.5	17442	.3078E-06	.6242E-05	.5670E-01	.3341E-04	.3137E-05	.3085E-01	.2608E-00	1.000	.2728	.0775	.2012E-03	.1290E-02	.1171E-02	.3222E-02	1.332	.6548E-04	.8601E-04	.6664	1.334	.2098E-03	45.701
13.0	17464	.2329E-06	.5258E-05	.5243E-01	.2741E-04	.3828E-05	.2848E-01	.2137E-00	1.000	.2717	.0768	.2182E-03	.1301E-02	.1257E-02	.3494E-02	1.334	.5298E-04	.7101E-04	.6613	1.335	.2275E-03	45.965
13.5	17483	.1786E-06	.4346E-05	.4386E-01	.2270E-04	.4626E-05	.2635E-01	.1768E-00	1.000	.2707	.0762	.2359E-03	.1313E-02	.1346E-02	.3774E-02	1.335	.4389E-04	.5919E-04	.6565	1.337	.2458E-03	46.216
14.0	17500	.1386E-06	.3624E-05	.4526E-01	.1897E-04	.5953E-05	.2447E-01	.1746E-00	1.000	.2697	.0756	.2540E-03	.1323E-02	.1436E-02	.4064E-02	1.337	.3667E-04	.4974E-04	.6519	1.339	.2646E-03	46.456
14.5	17515	.1086E-06	.3044E-05	.4223E-01	.1596E-04	.6594E-05	.2279E-01	.1241E-00	1.000	.2668	.0750	.2728E-03	.1333E-02	.1529E-02	.4363E-02	1.338	.3084E-04	.4207E-04	.6476	1.340	.2840E-03	46.688
15.0	17528	.8588E-07	.2754E-05	.3950E-01	.1352E-04	.7791E-05	.2128E-01	.1050E-00	1.000	.2679	.0745	.2923E-03	.1343E-02	.1624E-02	.4673E-02	1.340	.3583E-04	.6435	1.341	.3042E-03	46.910	
15.5	17541	.6849E-07	.2190E-05	.3703E-01	.1151E-04	.9152E-05	.1992E-01	.1000	.2670	.0740	.3123E-03	.1352E-02	.1722E-02	.4993E-02	1.341	.2226E-04	.3068E-04	.6395	1.343	.3250E-03	47.125	
16.0	17552	.5502E-07	.1873E-05	.3478E-01	.9859E-05	.1070E-05	.1868E-01	.1000	.2661	.0735	.3339E-03	.1361E-02	.1823E-02	.5324E-02	1.342	.1906E-04	.2640E-04	.6358	1.344	.3464E-03	47.334	
16.5	17562	.4453E-07	.1610E-05	.3274E-01	.8487E-05	.1243E-06	.1756E-01	.1000	.2654	.0730	.3541E-03	.1369E-02	.1925E-02	.5665E-02	1.344	.1640E-04	.2283E-04	.6322	1.345	.3683E-03	47.536	
17.0	17571	.3625E-07	.1390E-05	.3087E-01	.7334E-05	.1439E-06	.1653E-01	.1000	.2646	.0726	.3761E-03	.1377E-02	.2031E-02	.6018E-02	1.348	.1420E-04	.1782E-04	.6287	1.346	.3911E-03	47.733	
17.5	17579	.2967E-07	.1025E-05	.2915E-01	.6636E-05	.1660E-06	.1558E-01	.1000	.2638	.0722	.3989E-03	.1386E-02	.2139E-02	.6384E-02	1.349	.1231E-04	.1728E-04	.6253	1.348	.4147E-03	47.924	
18.0	17587	.2444E-07	.1049E-05	.2758E-01	.5545E-05	.1906E-06	.1472E-01	.1000	.2632	.0718	.4222E-03	.1393E-02	.2250E-02	.6760E-02	1.347	.1072E-04	.1513E-04	.6221	1.349	.4388E-03	48.110	
18.5	17594	.2024E-07	.9168E-06	.2613E-01	.4851E-05	.2179E-06	.1392E-01	.1000	.2627	.0714	.4459E-03	.1400E-02	.2362E-02	.7147E-02	1.348	.9380E-05	.1329E-04	.6190	1.350	.4634E-03	48.290	
19.0	17601	.1685E-07	.8042E-06	.2480E-01	.4258E-05	.2484E-06	.1318E-01	.1000	.2620	.0710	.4706E-03	.1408E-02	.2478E-02	.7547E-02	1.349	.8237E-05	.1172E-04	.6160	1.351	.4890E-03	48.466	
19.5	17607	.1408E-07	.7074E-06	.2356E-01	.3748E-05	.2822E-06	.1250E-01	.1000	.2615	.0707	.4957E-03	.1414E-02	.2596E-02	.7960E-02	1.350	.7250E-05	.1035E-04	.6131	1.352	.5150E-03	48.638	
20.0	17613	.1181E-06	.6241E-06	.2240E-01	.3309E-05	.3198E-06	.1187E-01	.1000	.2610	.0704	.5217E-03	.1421E-02	.2717E-02	.8386E-02	1.351	.6399E-05	.9176E-05	.6102	1.353	.5417E-03	48.807	
20.5	17618	.9960E-08	.5525E-06	.2134E-01	.2931E-05	.3611E-06	.1128E-01	.1000	.2604	.0701	.5481E-03	.1427E-02	.2840E-02	.8823E-02	1.352	.5669E-05	.8159E-05	.6075	1.354	.5691E-03	48.971	
21.0	17623	.8434E-08	.4907E-06	.2035E-01	.2604E-05	.4065E-06	.1073E-01	.1000	.2598	.0697	.5754E-03	.1434E-02	.2965E-02	.9271E-02	1.353	.5039E-05	.7280E-05	.6049	1.355	.5974E-03	49.130	
21.5	17627	.7168E-08	.4369E-06	.1942E-01	.2320E-0																	

Table I continued

$T_t = 8000^\circ\text{K}$ $p_t = 2000 \text{ atmospheres}$ $\rho_t = 59.28 \text{ atmospheres}$ $H_t = 149.18 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.151$ $S/R_t = 32.311$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_1	S/R_2
0.9973	5593	.5584E 00	.6215E 00	.9086E 00	.3417E 00	.1000E 01	.8951E 00	.1664E 05	1.138													
2.0	9793	.1310E 00	.1917E 00	.7108E 00	.3230E 00	.1852E 01	.6786E 00	.8983E 04	1.107	.5497	.3243	.4233E 01	.3084E 01	.1344E 01	.1424E 01	1.157	.6811E 00	.6864E 00	.9835	1.162	.5201E 01	32.754
2.5	11249	.5578E-01	.9560E-01	.6187E-00	.2126E-00	.1233E-01	.5759E-00	.5147E-04	1.086	.4735	.2428	.6777E 01	.4119E 01	.1526E 01	.1693E 01	1.170	.4327E 00	.4403E 00	.9642	1.173	.7756E-01	33.283
3.0	12407	.2288E-01	.4576E-01	.5412E-00	.1238E-00	.6124E-01	.4841E-00	.2717E-04	1.064	.4255	.1964	.9694E 01	.5091E 01	.1710E 01	.2025E 01	1.184	.2474E 00	.2549E 00	.9411	1.187	.1081E 02	33.942
3.5	13348	.9136E-02	.2121E-01	.4757E-00	.6642E-01	.1228E-02	.4028E-00	.1355E-04	1.042	.3914	.1666	.1312E 02	.6003E 01	.1898E 01	.2442E 01	1.199	.1314E 00	.1374E 00	.9158	1.202	.1438E 02	34.697
4.0	14141	.3504E-02	.9459E-02	.4167E-00	.3299E-02	.12599E-00	.6401E-00	.3656	1.1454	.1721E 02	.6877E 01	.2110E 01	.2990E 01	.1.214	.6533E-01	.6953E-01	.8892	1.217	.1864E 02	35.541		
4.5	14799	.1323E-02	.4176E-02	.3612E-00	.1607E-01	.5626E 02	.2659E 00	.2957E 03	1.010	.3463	.1300	.2213E 02	.7692E 01	.2365E 01	.3712E 01	1.228	.3144E-01	.3410E-01	.8625	1.231	.2376E 02	36.436
5.0	15322	.5136E-03	.1915E-02	.3080E-00	.7898E-02	.1185E 03	.2132E 00	.1404E 03	1.003	.3317	.1188	.2810E 02	.8419E 01	.2697E 01	.4639E 01	1.241	.1540E-01	.1703E-01	.8376	1.243	.2998E 02	37.318
5.5	15706	.2200E-03	.9706E-03	.2608E-00	.4208E-02	.2281E 03	.1732E 00	.7296E 01	1.000	.3212	.1110	.3301E 02	.9011E 01	.3108E 01	.5716E 01	1.251	.8162E-02	.9210E-02	.8164	1.253	.3720E 02	38.106
6.0	15981	.1069E-03	.5498E-03	.2229E-00	.2467E-02	.3957E 03	.1441E 00	.4205E 02	1.000	.3141	.1056	.4244E 02	.9474E 01	.3360E 01	.6873E 01	.1.259	.4787E-02	.5472E-02	.7990	1.261	.4495E 02	38.779
6.5	16181	.5623E-04	.3357E-03	.1928E-00	.1545E-02	.6399E 03	.1222E 00	.2600E 02	1.000	.3084	.1015	.5037E 02	.9853E 01	.4041E 01	.8112E 01	.1.265	.2993E-02	.3436E-02	.7841	1.267	.5923E 02	39.372
7.0	16345	.3116E-04	.2139E-03	.1677E-00	.1004E-02	.9942E 03	.1045E 00	.1673E 02	1.000	.3037	.0982	.5913E 02	.1019E 02	.4569E 01	.9483E 01	.1.271	.1944E-02	.2282E-02	.7706	1.273	.6236E 02	39.920
7.5	16470	.1840E-04	.1434E-03	.1477E-00	.6936E-03	.1474E 04	.9098E-01	.1130E 02	1.000	.3001	.0955	.6819E 02	.1047E 02	.5109E 02	.1092E 02	.1.275	.1322E-02	.1570E-02	.7589	1.277	.7183E-02	40.411
8.0	16574	.1117E-04	.9839E-04	.1307E-00	.4749E-03	.2132E 04	.7930E-01	.7804E 01	1.000	.2969	.0933	.7807E 02	.1072E 02	.5691E 01	.1251E 02	.1.280	.9177E-03	.1102E-02	.7480	1.282	.6213E 02	40.876
8.5	16860	.6993E-05	.5921E-04	.1163E-00	.3378E-03	.3015E 04	.6971E-01	.5518E 01	1.000	.2941	.0914	.8807E 02	.1095E 02	.6313E 01	.1423E 02	.1.284	.6518E-03	.7910E-03	.7379	1.288	.9921E 02	41.317
9.0	16732	.4491E-05	.4974E-04	.1039E-00	.2447E-03	.4177E 04	.6164E-01	.3983E 01	1.000	.2916	.0896	.1002E 03	.1116E 02	.6977E 01	.1610E 02	.1.287	.4724E-03	.5790E-03	.7286	1.289	.1052E 03	41.731
9.5	16792	.2968E-05	.3660E-04	.9336E-01	.1812E-03	.5657E 04	.5488E-01	.2941E 01	1.000	.2894	.0881	.1124E 03	.1135E 02	.7678E 01	.1809E 02	.1.290	.3501E-03	.4331E-03	.7201	1.292	.1180E 03	42.118
10.0	16843	.2010E-05	.2747E-04	.8424E-01	.1369E-03	.7515E 04	.4215E-01	.2241E 01	1.000	.2875	.0868	.1254E 03	.1152E 02	.8418E 01	.2020E 02	.1.293	.2642E-03	.3297E-03	.7122	1.295	.1315E 03	42.482
10.5	16886	.1394E-05	.2101E-05	.7636E-01	.1055E-03	.9798E-04	.4428E-01	.1698E 01	1.000	.2857	.0856	.1391E 03	.1168E 02	.9194E 01	.2243E 02	.1.296	.2031E-03	.2556E-03	.7050	1.298	.1458E 03	42.822
11.0	16923	.9870E-06	.1635E-04	.6951E-01	.8227E-04	.1257E 05	.4011E-01	.1324E 01	1.000	.2841	.0846	.1536E 03	.1182E 02	.1000E 02	.2476E-02	.1.299	.1587E-03	.2012E-03	.6982	1.300	.1608E 03	43.142
11.5	16959	.7139E-06	.1293E-05	.6395E-01	.1586E 05	.1049E 01	.2827	0.8037	.1.000	.2827	.0830	.1686E 03	.1195E 02	.1084E 02	.2718E 02	.1.301	.1260E-03	.1609E-03	.6920	1.303	.1764E 03	43.443
12.0	16981	.5255E-06	.1036E-04	.5838E-01	.5252E-04	.1975E 05	.3345E-01	.8423E 00	1.000	.2815	.0828	.1843E 03	.1208E 02	.1171E 02	.2970E 02	.1.303	.1013E-03	.1302E-03	.6862	1.305	.1928E 03	43.727
12.5	17001	.3930E-06	.8409E-05	.5381E-01	.4273E-04	.2431E 05	.3075E-01	.6843E 00	1.000	.2803	.0820	.2006E 03	.1220E 02	.1260E 02	.3231E 02	.1.305	.8241E-04	.1067E-03	.6808	1.307	.2097E 03	43.996
13.0	17026	.2981E-06	.6896E-05	.4977E-01	.3513E-04	.2915E 05	.2838E-01	.5619E 00	1.000	.2791	.0813	.2175E 03	.1230E 02	.1353E 02	.3501E 02	.1.307	.6775E-04	.8822E-04	.6756	1.309	.2273E 03	44.252
13.5	17044	.2291E-06	.5710E-05	.4619E-01	.2915E-04	.3572E 05	.2629E-01	.1.000	.2780	.0806	.2349E 03	.1241E 02	.1447E 02	.3780E 02	.1.309	.5622E-04	.7363E-03	.6708	1.310	.2454E 03	44.496	
14.0	17060	.1779E-06	.5716E-05	.4299E-01	.2437E-04	.4276E 05	.2442E-01	.3891E 00	1.000	.2770	.0800	.2530E 03	.1250E 02	.1544E 02	.4700E-04	.1.310	.6191E-04	.6663	.1.312	.2642E 03	44.731	
14.5	17075	.1395E-06	.4006E-05	.4011E-01	.2052E-04	.5083E 05	.2275E-01	.3273E 00	1.000	.2761	.0794	.2717E 03	.1260E 02	.1644E 02	.4368E 02	.1.312	.3958E-04	.5242E-04	.6619	1.313	.2836E 03	44.956
15.0	17088	.1105E-06	.3388E-05	.3753E-01	.1739E-04	.6002E 05	.2215E-01	.1.000	.2752	.0788	.2910E 03	.1277E 02	.1747E 02	.4677E 02	.1.313	.3355E-04	.4465E-04	.6577	1.315	.3036E 03	45.174	
15.5	17100	.8813E-07	.2884E-05	.3518E-01	.1482E-04	.7049E 05	.1989E-01	.2360E 00	1.000	.2744	.0783	.3109E 03	.1277E 02	.1852E 02	.4997E 02	.1.315	.2859E-04	.3828E-04	.6538	1.316	.3244E 03	45.384
16.0	17111	.7087E-07	.2466E-05	.3306E-01	.1270E-04	.8232E 05	.1866E-01	.2021E 00	1.000	.2736	.0776	.3135E 03	.1285E 02	.1960E 02	.5328E 02	.1.316	.2450E-04	.3294E-04	.6500	1.318	.3458E 03	45.587
16.5	17121	.5734E-07	.2122E-05	.3111E-01	.9571E 05	.1753E-01	.1738E 00	1.000	.2728	.0773	.3527E 03	.1293E 02	.2070E 02	.5670E 02	.1.317	.2109E-04	.2848E-04	.6463	1.319	.3678E 03	45.785	
17.0	17130	.4667E-07	.1831E-05	.2933E-01	.9444E-05	.1108E 06	.1501E 00	.1.000	.2721	.0769	.3747E 03	.1301E 02	.2184E 02	.6025E 02	.1.318	.1822E-04	.2473E-04	.6427	1.320	.3905E 03	45.977	
17.5	17138	.3822E-07	.1588E-05	.2771E-01	.8197E-05	.1277E 06	.1556E-01	.1303E 00	1.000	.2714	.0764	.3971E 03	.1308E 02	.2300E 02	.6390E 02	.1.320	.1582E-04	.2155E-04	.6393	1.321	.4138E 03	46.164
18.0	17145	.3150E-07	.1383E-05	.2622E-01	.7145E-05	.1466E 06	.1469E-01	.1135E 00	1.000	.2707	.0760	.4202E 03	.1315E 02	.2419E 02	.6766E 02	.1.321	.1379E-04	.1887E-04	.6361	1.322	.4377E-04	46.346
18.5	17152	.2608E-07	.1209E-05	.2484E-01	.6250E-05	.1677E 06	.1390E-01	.9924E-01	1.000	.2701	.0756	.4439E 03	.1322E 02	.2540E 02	.7155E 02	.1.322	.1206E-04	.1657E-04	.6329	1.323	.4623E 03	46.524
19.0	17159	.2169E-07	.1060E-05	.2357E-01	.5484E-05	.1912E 06	.1316E-01	.8703E-01	1.000	.2694	.0753	.4683E 03	.1329E 02	.2665E 02	.7557E 02	.1.323	.1058E-04	.1460E-04	.6298	1.325	.4876E 03	46.697
19.5	17165	.1813E-07	.9322E-06	.2238E-01	.4827E-05	.2173E 06	.1247E-01	.7658E-01	1.000	.2689	.0749	.4935E 03	.1335E 02	.2792E 02	.7972E 02	.1.324	.9311E-05	.1290E-04	.6268	1.325	.5137E 03	46.867
20.0	17170	.1522E-07	.8229E-06	.2129E-01	.4263E-05	.2461E 06	.1184E-01	.6762E-01	1.000	.2683	.0745	.5193E 03	.1342E 02	.2922E 02	.8398E 02	.1.325	.8226E-05	.1144E-04	.6240	1.326	.5405E 03	47.031
20.5	17175	.1284E-07	.7286E-06	.2078E-01	.3777E-05	.2778E 06	.1126E-01	.5898E-01	1.000	.2677	.0742	.5458E 03	.1348E 02	.3054E 02	.8836E 02	.1.326	.7291E-05	.1018E-04	.6212	1.327	.5680E 03	47.192
21.0	17180	.1087E-07	.6470E-06	.1934E-01	.3356E-05	.3128E 06	.1071E-01	.5320E 01	1.000	.2672	.0739	.5728E 03	.1354E 02									

Table I continued

$T_t = 8000^\circ\text{K}$ $P_t = 3000 \text{ atmospheres}$ $\rho_t = 90.33 \text{ atmospheres}$ $H_t = 145.18 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.133$ $S/R_t = 31.686$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9978	5552	.5577E 00	.6219E 00	.9061E 00	.3423E 00	.1000E 01	.8938E 00	.2518E 05	1.122													
2.0	9701	.1312E 00	.1925E 00	.7074E 00	.3235E 00	.1840E 01	.6759E 00	.1362E 05	1.092	.5501	.3258	.6325E 01	.3070E 01	.1349E 01	.1429E 01	.5817E 00	.6866E 00	.9839	1.144	.5197E 01	32.121	
2.5	11139	.5609E-01	.9626E-01	.6160E 00	.2132E 00	.5793E 01	.7819E 04	.1.072	.4744E 02	.6746E 01	.4095E 01	.1532E 01	.1702E 01	.1.152	.4337E 00	.4408E 00	.9651	1.156	.7739E 01	32.640		
3.0	12299	.2288E-01	.4587E-01	.5375E 00	.1238E 00	.6124E 01	.4794E 00	.4112E 04	1.052	.4257	.1974	.5682E 01	.5065E 01	.1722E 01	.2044E 01	1.167	.2472E 00	.2542E 00	.9621	1.170	.1081E 01	33.293
3.5	13232	.9088E-02	.2121E-01	.4704E 00	.6628E 00	.1231E 02	.3970E 00	.2046E 04	1.033	.3918	.1675	.1314E 02	.5970E 01	.1922E 01	.2476E 01	1.183	.1310E 00	.1366E 00	.9170	1.185	.1442E 02	34.040
4.0	14016	.3481E-02	.9481E-02	.4092E 00	.3235E-01	.2599E 02	.6960E 00	1.017	.3661	.1730E 02	.6827E 01	.2151E 01	.3047E 01	.1.198	.6528E-01	.6920E-01	.8906	1.201	.1876E 02	34.870		
4.5	14653	.1331E-02	.4261E-02	.3520E 00	.1633E-01	.5531E 02	.2605E 00	.4553E 03	1.006	.3474	.1315	.2236E 02	.7607E 01	.2432E 01	.3789E 01	1.213	.3192E-01	.3444E-01	.8648	1.215	.2397E 02	35.734
5.0	15152	.5295E-03	.2010E-02	.2982E 00	.8236E-02	.1134E 03	.2093E 00	.2221E 01	1.001	.3236	.1207	.2835E 02	.8286E 01	.2796E 01	.4723E 01	1.226	.1604E-01	.1760E-01	.8411	1.228	.3029E 02	36.574
5.5	15510	.2365E-03	.1059E-02	.2530E 00	.4548E-02	.2102E 03	.1715E 00	.1198E 02	1.000	.3239	.1133	.3511E 02	.8825E 01	.3221E 01	.5769E 01	1.234	.8832E-02	.9849E-02	.8213	1.238	.3735E 02	37.309
6.0	15773	.1165E-03	.8087E-03	.2183E 00	.2703E-02	.3597E 03	.1432E 00	.7001E 02	1.000	.3168	.1080	.4247E 02	.9295E 01	.6191E 01	.1.243	.5239E-02	.5926E-02	.8045	1.245	.4506E 02	37.957	
6.5	15972	.6158E-03	.3729E-03	.1871E 00	.5797E 03	.1214E 00	.4344E 00	.1.000	.3115	.1040	.5041E 02	.9618E 01	.4192E 01	.8162E 01	1.250	.3286E-02	.3765E-02	.7899	1.252	.5336E 02	38.539	
7.0	16127	.3469E-04	.2408E-03	.1633E 00	.1118E-02	.8895E 03	.1043E 00	.2823E 02	1.000	.3068	.1007	.5896E 02	.9927E 01	.4729E 01	.9504E 01	1.256	.2161E-02	.2506E-02	.7771	1.258	.6230E 02	39.064
7.5	16251	.2042E-04	.1611E-03	.1436E 00	.7595E-03	.1219E 04	.9036E 01	.1909E 02	1.000	.3036	.0981	.6876E 02	.1019E 02	.5296E 01	.1096E 02	1.261	.1466E-02	.1720E-02	.7654	1.263	.7182E 02	39.553
8.0	16353	.1241E-04	.1107E-03	.1271E 00	.5284E-03	.1908E 04	.7898E-01	.1320E 02	1.000	.3004	.0958	.7796E 02	.1044E 02	.5904E 01	.1255E 02	1.265	.1020E-02	.1209E-02	.7547	1.267	.8215E 02	40.012
8.5	16437	.7779E-05	.7798E-04	.1131E 00	.3761E-03	.2694E 04	.6943E-01	.9347E 01	1.000	.2976	.0938	.8663E 02	.1066E 02	.6552E 02	.1428E 02	1.269	.7256E-03	.8686E-03	.7448	1.271	.9328E 02	40.443
9.0	16508	.5004E-05	.5615E-04	.1010E 00	.2732E-03	.3725E 04	.6140E-01	.6760E 01	1.000	.2951	.0921	.1001E 03	.1085E 02	.7245E 01	.1616E 02	1.273	.5268E-03	.6366E-03	.7356	1.275	.1053E 03	40.851
9.5	16567	.3312E-05	.4138E-01	.9072E-01	.2027E-03	.5037E 04	.5467E-01	.4999E 01	1.000	.2929	.0906	.1123E 03	.1103E 02	.7977E 01	.1815E 02	1.276	.3908E-03	.4766E-03	.7272	1.278	.1180E 03	41.231
10.0	16617	.2249E-05	.3113E-04	.8186E-01	.1593E-01	.6676E 05	.4898E-03	.3772E 01	1.000	.2911	.0893	.1253E 03	.1120E 02	.8747E 01	.2026E 01	1.279	.2957E-03	.3637E-03	.7195	1.281	.1315E 03	41.588
10.5	16659	.1561E-05	.2385E-04	.7419E-01	.1181E-03	.8693E 04	.4414E-01	.2897E 01	1.000	.2895	.0881	.1390E 03	.1135E 02	.9556E 01	.2249E 02	1.282	.2276E-03	.2821E-03	.7123	1.284	.1458E 03	41.923
11.0	16695	.1108E-05	.1859E-04	.6756E-01	.9250E-04	.1113E 05	.4001E-01	.2263E 01	1.000	.2878	.0871	.1534E 03	.1148E 02	.1040E 02	.2481E 02	1.285	.1782E-03	.2225E-03	.7056	1.286	.1608E 03	42.238
11.5	16726	.8029E-05	.1473E-04	.6180E-01	.7354E-04	.1402E 05	.3646E-01	.1796E 01	1.000	.2865	.0861	.1683E 03	.1161E 02	.1127E 02	.2723E 02	1.287	.1781E-03	.6995	1.289	.1764E 03	42.533	
12.0	16753	.5920E-06	.1182E-04	.5676E-01	.5922E-04	.1744E 05	.3339E-01	.1444E 01	1.000	.2852	.0852	.1840E 03	.1173E 02	.1217E 02	.2974E 02	1.289	.1141E-03	.1444E-03	.6937	1.291	.1928E 03	42.812
12.5	16776	.4432E-06	.9601E-05	.5232E-05	.4823E-04	.2144E 05	.3070E 01	.1175E 01	1.000	.2840	.0845	.2020E 03	.1184E 02	.1310E 02	.3234E 02	1.291	.9292E-04	.1184E-04	.6883	1.293	.2096E 03	43.437
13.0	16796	.3366E-06	.7881E-05	.4844E-01	.3969E-04	.2609E 05	.2825E-01	.9653E 00	1.000	.2831	.0838	.2170E 03	.1194E 02	.1406E 02	.3504E 02	1.293	.7644E-04	.9795E-04	.6832	1.295	.2271E 03	43.329
13.5	16814	.2589E-06	.6531E-05	.4493E-01	.3296E-04	.3145E 05	.2626E-01	.8008E 00	1.000	.2820	.0831	.2344E 03	.1204E 02	.1504E 02	.3782E 02	1.295	.6355E-04	.8183E-04	.6785	1.296	.2452E 03	43.570
14.0	16830	.2012E-06	.5453E-05	.4182E-01	.2757E-04	.3763E 05	.2440E-01	.6692E 00	1.000	.2809	.0824	.2524E 03	.1213E 02	.1605E 02	.4071E 02	1.296	.5312E-04	.6883E-04	.6739	1.298	.2640E 03	43.801
14.5	16845	.1579E-06	.4586E-05	.3903E-01	.2323E-04	.4470E 05	.2273E-01	.5633E 00	1.000	.2800	.0818	.2711E 03	.1222E 02	.1709E 02	.4370E 02	1.298	.4475E-04	.5828E-04	.6696	1.300	.2834E 03	44.024
15.0	16858	.1250E-06	.3881E-05	.3661E-01	.1969E-05	.5212E 05	.4771E 05	.1.000	.2792	.0813	.2920E 03	.1230E 02	.1815E 02	.4679E 02	1.300	.3792E-04	.4964E-04	.6654	1.301	.3033E 03	44.239	
15.5	16869	.9979E-07	.3304E-05	.3424E-01	.1678E-04	.6197E 05	.1988E-01	.4046E 00	1.000	.2782	.0807	.3102E 03	.1239E 02	.1925E 02	.4999E 02	1.301	.3234E-04	.4254E-04	.6614	1.302	.3241E 03	44.446
16.0	16880	.8024E-07	.2827E-05	.3217E-01	.1438E-04	.7236E 05	.1864E-01	.3648E 00	1.000	.2775	.0802	.3306E 03	.1247E 02	.2037E 02	.5330E 02	1.302	.2771E-04	.3663E-04	.6576	1.304	.3453E 03	44.647
16.5	16890	.6491E-07	.2430E-05	.3028E-01	.1237E-04	.8414E 05	.1752E-01	.2993E 00	1.000	.2768	.0797	.3517E 03	.1254E 02	.2152E 02	.5673E 02	1.303	.2384E-04	.3166E-04	.6539	1.305	.3673E 03	44.843
17.0	16939	.5284E-07	.2098E-05	.25855E-01	.1069E-02	.9714E 05	.1649E-01	.2855E 00	1.000	.2761	.0793	.3736E 03	.1262E 02	.2270E 02	.6028E 02	1.305	.2061E-04	.2750E-04	.6504	1.306	.3901E 03	45.033
17.5	16907	.4329E-07	.1820E-05	.2697E-01	.9284E-05	.1212E 06	.1555E-01	.2243E 00	1.000	.2755	.0788	.3956E 03	.1268E 02	.2391E 02	.6393E 02	1.306	.1789E-04	.2397E-04	.6469	1.308	.4133E 03	45.218
18.0	16914	.3567E-07	.1585E-05	.2551E-01	.8093E-05	.1288E 06	.1468E-01	.1955E 00	1.000	.2748	.0784	.4189E 03	.1275E 02	.2514E 02	.6770E 02	1.307	.1559E-04	.2098E-04	.6436	1.309	.4371E 03	45.398
18.5	16921	.2954E-07	.1385E-05	.2417E-01	.7078E-01	.1388E-01	.1709E 00	1.000	.2742	.0780	.4427E 03	.1282E 02	.2641E 02	.7195E 02	1.308	.1364E-04	.1843E-04	.6405	1.310	.4618E 03	45.573	
19.0	16927	.2456E-07	.1214E-05	.2293E-01	.6209E-05	.1680E 06	.1314E-01	.1498E 00	1.000	.2735	.0776	.4672E 03	.1288E 02	.2770E 02	.7563E 02	1.309	.1196E-04	.1623E-04	.6374	1.311	.4871E 03	45.744
19.5	16933	.2053E-07	.1068E-05	.2178E-01	.5466E-05	.1910E 06	.1246E-01	.1319E 00	1.000	.2729	.0773	.4922E 03	.1294E 02	.2930E 02	.7978E 02	1.310	.1053E-04	.1434E-04	.6344	1.312	.5131E 03	45.912
20.0	16938	.1724E-07	.9428E-06	.2072E-01	.4829E-05	.2162E 06	.1183E-01	.1615E 00	1.000	.2723	.0769	.5109E 03	.1307E 02	.3037E 02	.8404E 02	1.311	.9305E-05	.1272E-05	.6315	1.313	.5398E 03	46.075
20.5	16944	.1454E-07	.8348E-06	.1974E-01	.4278E-05	.2441E 06	.1124E-01	.1631E 00	1.000	.2717	.0765	.5443E 03	.1307E 02	.3175E 02	.8843E 02	1.312	.8246E-05	.1132E-04	.6287	1.314	.5672E 03	46.234
21.0	16948	.1231E-07	.7412E-06	.1882E-01	.3801E-05	.2749E 06	.1070E-01	.9161E-01	1.000	.2710	.0762	.5715E 03	.1313E 02</									

Table I, continued

$T_t = 9000^{\circ}\text{K}$ $P_t = 200 \text{ atmospheres}$ $P_t = 4.33 \text{ atmospheres}$ $H_t = 245.81 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.401$ $S/R_t = 38.847$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/H_t	ρU	Z	M ₂	U_2/U_1	p_2/p_1	P_2/P_1	T_2/T_1	H_2/H_1	Z ₂	P_{t2}/P_t	P_{t2}/P_t	T_{t2}/T_t	Z _{t2}	P_{t2}/P_1	S/R ₂
0.9996	6479	.5697E 00	.6198E 00	.9384E 00	.3340E 00	.1000E 01	.9146E 00	.1404E 04	1.372													
2.0	11634	.1335E 00	.1794E 00	.7995E 00	.3117E 00	.1924E 01	.7247E 00	.7296E 03	1.304	.5332	.3039	.4249E 01	.3291E 01	.1200E 01	.1345E 01	1.403	.6694E 00	.6796E 00	.9772	1.412	.5012E 01	.39.411
2.5	13621	.5292E-01	.8114E-01	.7212E 00	.1932E 00	.3634E 01	.6226E 00	.3863E 03	1.267	.4483	.2166	.6720E 01	.4617E 01	.1299E 01	.1578E 01	1.419	.3999E 00	.4142E 00	.9490	1.426	.7558E 01	.40.142
3.0	15258	.1943E-01	.3451E-01	.6401E 00	.1031E 00	.7626E 00	.5264E 00	.1840E 03	1.233	.3945	.1679	.9829E 01	.5957E 01	.1416E 01	.1874E 01	1.436	.2091E 00	.2221E 00	.9151	1.441	.1076E 02	.41.070
3.5	16599	.6743E-02	.1423E-01	.5511E 00	.5032E-01	.1700E 02	.4395E 00	.8256E 02	1.205	.3573	.1377	.1387E 02	.7261E 01	.1583E 01	.2251E 01	1.454	.1007E 00	.1101E 00	.8789	1.458	.1493E 02	.42.128
4.0	17519	.2673E-02	.6710E 00	.4712E 00	.2643E-01	.3417E 02	.3756E 00	.4109E 03	1.185	.3349	.1205	.1839E 02	.8297E 01	.1789E 01	.2638E 01	1.468	.5245E-01	.5888E-01	.8484	1.471	.1962E 02	.43.083
4.5	18139	.1247E-02	.3593E-02	.4178E 00	.1517E-01	.6163E 02	.3307E 00	.2278E 02	1.164	.3203	.1099	.2266E 02	.9098E 01	.1960E 01	.2999E 01	1.479	.2997E-01	.3441E-01	.8235	1.482	.2404E-02	.43.908
5.0	18686	.5636E-03	.1837E-02	.3777E 00	.8232E-02	.1170E 03	.2897E 00	.1200E 02	1.138	.3071	.1009	.2726E 02	.9908E 01	.2101E 01	.3427E 01	1.490	.1622E-01	.1908E-01	.7975	1.493	.2878E 02	.44.822
5.5	19202	.2366E-03	.8673E-03	.3445E 00	.4104E-02	.2412E 03	.2499E 00	.5821E 01	1.109	.2945	.0927	.3248E 02	.1078E 01	.2224E 01	.3975E 01	1.502	.8075E-02	.7976E 02	.7696	1.505	.3413E 02	.45.867
6.0	19681	.9353E-04	.3844E-03	.3155E 00	.1911E-02	.5309E 03	.2120E 00	.2644E 01	1.081	.2829	.0855	.3837E 02	.1170E 02	.2339E 01	.4668E 01	1.515	.3755E-02	.4682E-02	.7407	1.518	.4015E 02	.47.023
6.5	20117	.3556E-04	.1637E-03	.2890E 00	.8500E-03	.1220E 04	.1768E 00	.1151E 01	1.054	.2724	.0791	.4501E 02	.1265E 02	.5627E 01	.1.527	.1669E-02	.2148E-02	.7120	1.530	.4694E 02	.48.258	
7.0	20503	.1337E-04	.6897E-04	.2636E 00	.3721E-03	.2840E 04	.1449E 00	.4942E 00	1.030	.2630	.0736	.5256E 02	.1359E 02	.2589E 01	.6869E 01	1.539	.7306E-03	.9705E-03	.6846	1.541	.5466E 02	.49.526
7.5	20847	.4904E-05	.2876E-04	.2361E 00	.1604E-03	.6698E 04	.1160E 00	.2096E 00	1.012	.2545	.0688	.6191E 02	.1453E 02	.2781E 01	.8588E 01	1.549	.3149E-03	.4319E-03	.6585	1.552	.6422E 02	.50.827
8.0	21141	.1795E-05	.1242E-04	.2022E 00	.7124E-04	.1529E 05	.9081E-01	.9178E-01	1.002	.2474	.0648	.7519E 02	.1542E 02	.3132E 01	.1097E 02	1.559	.1397E-03	.1975E-03	.6349	1.561	.7782E 02	.52.091
8.5	21310	.9092E-06	.7260E-05	.1755E 00	.4231E-04	.2596E 05	.7627E-01	.5407E-01	1.000	.2434	.0626	.8822E 02	.1598E 02	.3529E 01	.1306E 02	1.565	.8291E-04	.1195E-03	.6205	1.567	.9119E 02	.52.907
9.0	21423	.5359E-06	.4837E-05	.1552E 00	.2849E-04	.3875E 05	.6638E-01	.3622E-01	1.000	.2404	.0610	.1008E 03	.1639E 02	.3921E 01	.1501E 02	1.569	.5582E-04	.8162E-04	.6100	1.571	.1042E 03	.53.527
9.5	21506	.3479E-06	.3482E-05	.1400E 00	.2067E-04	.5364E 05	.5917E-01	.2617E-01	1.000	.2382	.0598	.1127E 03	.1671E 02	.4288E 01	.1684E 02	1.573	.4046E-04	.5986E-04	.6016	1.574	.1163E 03	.54.033
10.0	21577	.2294E-06	.2540E-05	.1266E 00	.1518E-04	.7328E 05	.5290E-01	.1916E-01	1.000	.2363	.0588	.1255E 03	.1701E 02	.4682E 01	.1884E 02	1.576	.2971E-04	.4445E-04	.5938	1.578	.1295E 03	.54.520
10.5	21638	.1549E-05	.1889E-05	.1149E 00	.1135E-01	.9827E 05	.4754E-01	.1428E-01	1.000	.2345	.0578	.1390E 03	.1792E 02	.5094E 01	.2097E 02	1.579	.2221E-04	.3357E-04	.5866	1.580	.1434E 03	.54.979
11.0	21691	.1067E-06	.1428E-05	.1047E 00	.8622E-05	.1297E 06	.4291E-01	.1083E-01	1.000	.2329	.0570	.1533E 03	.1755E 02	.5527E 01	.2323E 01	1.581	.1687E-04	.2575E-04	.5799	1.583	.1581E 03	.55.414
11.5	21737	.7477E-07	.1095E-05	.9571E-01	.6638E-05	.1688E 06	.3888E 01	.8317E-02	1.000	.2314	.0562	.1685E 03	.1778E 02	.5983E 01	.2564E 02	1.584	.1299E-04	.2000E-05	.5737	1.586	.1737E 03	.55.829
12.0	21776	.5337E-07	.8521E-06	.8776E-01	.5186E-05	.2165E 06	.3538E-01	.6485E-02	1.000	.2300	.0555	.1845E 03	.1801E 02	.6460E 01	.2818E 02	1.586	.1014E-04	.1576E-04	.5679	1.588	.1901E 03	.56.221
12.5	21810	.3874E-07	.6724E-06	.8073E-01	.4105E-05	.2738E 06	.3233E-01	.5126E-02	1.000	.2288	.0549	.2012E 03	.1821E 02	.6957E 01	.3084E 02	1.588	.8025E-05	.1257E-04	.5626	1.590	.2071E 03	.56.594
13.0	21841	.2857E-07	.5375E-06	.7474E-01	.3219E-05	.3421E 06	.2966E-01	.4103E-02	1.000	.2276	.0543	.2188E 03	.1841E 02	.7475E 01	.3362E 02	1.590	.6434E-05	.1016E-04	.5576	1.592	.2252E 03	.56.945
13.5	21867	.2139E-07	.4349E-06	.6892E 01	.2669E-05	.4223E 06	.2731E-01	.3324E-02	1.000	.2266	.0538	.2371E 03	.1859E 02	.8011E 01	.3651E 01	1.592	.5218E-05	.8296E-05	.5530	1.594	.2439E 03	.57.279
14.0	21890	.1623E-07	.3556E-06	.6394E-01	.2187E-05	.5160E 06	.2524E-02	.2721E 02	1.000	.2256	.0533	.2561E 03	.1876E 02	.8567E 01	.3952E 02	1.594	.4275E-05	.6844E-05	.5486	1.595	.2635E 03	.57.597
14.5	21911	.1248E-07	.2939E-06	.5950E-01	.1811E-05	.6237E 06	.2340E-01	.2251E-02	1.000	.2248	.0529	.2758E 03	.1892E 02	.9137E 01	.4261E 02	1.595	.3539E-05	.5702E-05	.5446	1.597	.2836E 03	.57.899
15.0	21929	.9719E-08	.2453E-06	.5553E-01	.1514E-05	.7467E 06	.2178E-01	.1880E-02	1.000	.2239	.0524	.2961E 03	.1907E 02	.9724E 01	.4579E 02	1.597	.2959E-05	.4796E-05	.5408	1.599	.3044E 03	.58.185
15.5	21945	.7651E-08	.2064E-06	.5194E-01	.1276E-05	.8687E 06	.2032E-01	.1583E-02	1.000	.2231	.0521	.3171E 03	.1921E 02	.1033E 02	.4907E 02	1.598	.2493E-05	.4065E-05	.5372	1.600	.3259E 03	.58.459
16.0	21960	.6082E-08	.1750E-06	.4871E-01	.1083E-05	.1045E 07	.1902E-01	.1343E-02	1.000	.2224	.0517	.3386E 03	.1934E 02	.1094E 02	.5244E 02	1.600	.2117E-05	.3471E-05	.5338	1.601	.3481E 03	.58.721
16.5	21973	.4879E-06	.1494E-05	.4577E-01	.1224E-07	.1784E 07	.1147E-01	.2117E 02	1.000	.2217	.0514	.3608E 03	.1947E 02	.1157E 02	.5591E 02	1.601	.1809E-05	.2981E-05	.5306	1.603	.3707E 03	.58.973
17.0	21985	.3947E-08	.1283E-06	.4311E-01	.7958E-06	.1424E 07	.1677E-01	.9858E-03	1.000	.2210	.0510	.3837E 03	.1960E 02	.1222E 02	.5946E 02	1.602	.1556E-05	.2577E-05	.5275	1.604	.3942E 03	.59.214
17.5	21996	.3218E-08	.1108E-06	.4068E-01	.6882E-06	.1548E 07	.1581E-01	.8520E-03	1.000	.2205	.0507	.4069E 03	.1971E 02	.1288E 02	.6310E 02	1.603	.1345E-05	.2239E-05	.5246	1.605	.4180E 03	.59.448
18.0	22006	.2640E-08	.9620E-07	.3846E-01	.5979E-06	.1897E 07	.1492E 01	.7399E-03	1.000	.2199	.0504	.4309E 03	.1982E 02	.1355E 02	.6684E 02	1.605	.1169E-05	.1954E-05	.5218	1.606	.4426E 03	.59.673
18.5	22015	.2180E-08	.8388E-07	.3642E-01	.5217E-06	.2175E 07	.1411E-01	.6454E-03	1.000	.2193	.0502	.4556E 03	.1993E 02	.1069E 02	.1630E 02	1.606	.1020E-05	.1713E-05	.5191	1.607	.4678E 03	.59.892
19.0	22023	.1810E-08	.7345E-07	.3454E-01	.4572E-06	.2483E 07	.1337E 01	.5654E-03	1.000	.2188	.0499	.4807E 03	.2003E 02	.1049E 02	.7463E 02	1.607	.8937E-06	.1508E-05	.5165	1.608	.4936E 03	.60.105
19.5	22031	.1511E-08	.6456E-07	.3280E-01	.4022E-06	.2824E 07	.1268E-01	.4971E-03	1.000	.2183	.0497	.5066E 03	.2014E 02	.1565E 02	.7868E 02	1.608	.7863E-06	.1332E-05	.5141	1.609	.5203E 03	.60.310
20.0	22038	.1268E-08	.5694E-07	.3120E-01	.4386E-06	.3201E 07	.1204E-01	.4943E-03	1.000	.2177	.0494	.5333E 03	.2024E 02	.1638E 02	.8284E 02	1.609	.6940E-06	.1180E-05	.5117	1.610	.5475E 03	.60.512
20.5	22044	.1068E-08	.5039E-07	.2971E-01	.3143E-06	.3615E 07	.1145E 01	.3883E-03	1.000	.2173	.0492	.5603E 03	.2033E 02	.1712E 02	.8711E 02	1.609	.6142E-06	.1049E-05	.5093	1.611	.5749E 03	.60.708
21.0	22051	.9041E-09	.4473E-07	.2791E-06	.4072E 07	.1091E-01</																

Table I continued

$T_t = 9000^{\circ}\text{K}$ $P_t = 500 \text{ atmospheres}$ $\rho_t = 11.56 \text{ atmospheres}$ $H_t = 214.75 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.312$ $S/R_t = 36.488$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/p_t	ρ_2/ρ_t	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_1	S/R_2
0.9980	6278	.5679E 00	.6204E 00	.9321E 00	.3352E 00	.1000E 01	.9082E 03	.3635E 04	1.289													
2.0	11241	.1318E 00	.1810E 00	.7745E 00	.3134E 00	.1915E 01	.7057E 04	.1898E 04	1.234	.5368	.3074	.4293E 01	.3253E 01	.1238E 01	.1378E 01	1.316	.6698E 00	.6788E 00	.9783	1.323	.5080E 01	37.016
2.5	13108	.5241E-01	.8356E-01	.6821E 00	.1968E 00	.3556E 01	.5999E 00	.1022E 04	1.206	.4545	.2219	.6843E 01	.4507E 01	.1376E 01	.1624E 01	1.331	.4048E 00	.4174E 00	.9519	1.337	.7724E 01	37.586
3.0	14586	.1976E-01	.2744E-01	.5858E 00	.1092E 00	.7134E 01	.5046E 00	.5096E 03	1.182	.4044	.1754	.1011E 02	.9702E 01	.1556E 01	.1951E 01	1.348	.2198E 00	.2318E 00	.9211	1.352	.1112E 02	38.506
3.5	15630	.8120E-02	.1819E-01	.5052E 00	.6091E 01	.1370E 02	.4312E 00	.2653E 03	1.159	.3732	.1495	.1376E 02	.6690E 01	.1751E 01	.2290E 01	1.362	.1212E 00	.1305E 00	.8923	1.366	.1493E 02	39.314
4.0	16418	.3526E-02	.9139E-02	.4446E 00	.3376E-01	.2596E 02	.3724E 00	.1400E 03	1.134	.3515	.1323	.1761E 02	.7557E 01	.1922E 01	.2656E 01	1.375	.6673E-01	.7346E-01	.8646	1.379	.1892E 02	40.132
4.5	17095	.1488E-02	.4407E-02	.4040E 00	.1765E 01	.5171E 02	.3195E 00	.7030E 02	1.106	.3332	.1188	.2190E 02	.8416E 01	.2074E 01	.3100E 01	1.388	.3476E-01	.3921E-01	.8358	1.392	.2335E 02	41.035
5.0	17700	.5990E-03	.2015E-02	.3617E 00	.8651E-02	.1092E 03	.2705E 00	.3328E 02	1.079	.3172	.1075	.2678E 02	.9298E 01	.2215E 01	.3665E 01	1.402	.1700E-01	.1970E-01	.8058	1.405	.2837E 02	42.034
5.5	18237	.2322E-03	.8846E-03	.3273E 00	.4032E-02	.2415E 03	.2255E 00	.1505E 02	1.052	.3031	.0981	.3232E 02	.1019E 02	.2358E 01	.4401E 01	1.415	.7911E-02	.9440E-02	.7754	1.418	.3407E 02	43.113
6.0	18711	.8789E-04	.3798E-03	.2951E 00	.1822E-02	.5483E 01	.1848E 00	.6630E 01	1.029	.2905	.0902	.3872E 02	.1106E 02	.2517E 01	.5374E 01	1.428	.3572E-02	.4393E-02	.7458	1.431	.4064E 02	44.245
6.5	19122	.3288E-03	.1628E-03	.2620E 00	.8156E-03	.1252E 04	.1486E 00	.2904E 01	1.012	.2804	.0836	.6464E 02	.1196E 02	.2729E 01	.6688E 01	1.440	.1597E-02	.2025E-02	.7175	1.443	.4858E 02	45.401
7.0	19463	.1255E-04	.7294E-04	.2252E 00	.3778E-03	.2744E 04	.1180E 00	.1325E 01	1.002	.2716	.0783	.5662E 02	.1277E 02	.3063E 01	.8429E 01	1.451	.7409E-03	.9668E-03	.6921	1.453	.5904E 02	46.512
7.5	19687	.5912E-05	.4010E-04	.1934E 00	.2130E-03	.4935E 04	.9758E-01	.7366E 00	1.000	.2659	.0749	.6765E 02	.1336E 02	.3474E 01	.1202E 02	1.458	.4162E-03	.5549E-03	.6739	1.460	.7041E 02	47.352
8.0	19834	.3229E-05	.2570E-04	.1700E 00	.1388E-03	.7642E 04	.8407E-01	.4757E 00	1.000	.2620	.0726	.7820E 02	.1378E 01	.3878E 01	.1184E 02	1.464	.2706E-03	.3666E-03	.6609	1.466	.8120E 02	47.981
8.5	19948	.1997E-05	.1740E-04	.1506E 00	.9498E-04	.1123E 05	.7348E-01	.3238E 00	1.000	.2589	.0707	.8927E 02	.1414E 02	.4901E 01	.1353E 02	1.468	.1851E-03	.2593E-03	.6498	1.470	.9269E 02	48.538
9.0	20037	.1272E-05	.1235E-04	.1352E 00	.6796E-04	.1574E 05	.6514E-01	.2309E 00	1.000	.2565	.0693	.1004E 03	.1444E 02	.4723E 01	.1528E 02	1.472	.2316E 03	.4602	.1474E-03	.1042E 03	49.029	
9.5	20114	.8253E-06	.8901E-05	.1217E 00	.4935E-04	.2176E 05	.5795E-01	.1671E 00	1.000	.2540	.0679	.1125E 03	.1747E 02	.5176E 01	.1718E 02	1.476	.9625E-04	.1354E-03	.6313	1.478	.1166E 03	49.501
10.0	20180	.5483E-06	.6543E-05	.1100E 00	.3652E-04	.2951E 05	.5182E-01	.1232E 00	1.000	.2519	.0667	.1253E 03	.1499E 02	.5653E 01	.1922E 02	1.479	.7118E-04	.1012E-03	.6231	1.481	.1298E 03	49.947
10.5	20236	.3722E-06	.4895E-05	.9976E-01	.2747E-04	.3933E 05	.4656E-01	.9244E-01	1.000	.2501	.0657	.1389E 03	.1523E 02	.6155E 01	.2139E 02	1.482	.5353E-04	.7691E-04	.6155	1.484	.1438E 03	50.370
11.0	20284	.2575E-06	.3721E-05	.9080E-01	.2098E-04	.5162E 05	.4020E-01	.7042E 01	1.000	.2484	.0647	.1534E 03	.1545E 02	.6686E 01	.2370E 02	1.485	.4087E-04	.5930E-04	.6085	1.487	.1588E 03	50.770
11.5	20325	.1819E-06	.2876E-05	.8297E-01	.1629E-04	.6663E 05	.3811E 01	.5456E-01	1.000	.2469	.0639	.1686E 03	.1566E 02	.7239E 01	.2613E 02	1.487	.3172E 04	.4644E-04	.6020	1.489	.1744E 03	51.147
12.0	20361	.1307E-06	.2255E-05	.7605E-01	.1281E-04	.8483E 05	.3471E-01	.4285E-01	1.000	.2454	.0631	.1847E 03	.1585E 02	.7818E 01	.2869E 02	1.490	.2497E-04	.3686E-04	.5959	1.491	.1910E 03	51.504
12.5	20392	.9569E-07	.1795E-01	.6997E-01	.1023E-04	.1065E 06	.3177E-01	.3415E-01	1.000	.2441	.0624	.2014E 03	.1603E 02	.8241E 01	.3136E 02	1.492	.1993E-04	.2956E-04	.5903	1.494	.2082E 03	51.840
13.0	20419	.7108E-07	.1445E-05	.6456E-01	.8256E-05	.2191E 06	.2753E-01	.1000	1.000	.2430	.0617	.2189E 03	.1620E 02	.9044E 01	.3414E 02	1.494	.1608E-04	.2410E-04	.5851	1.496	.2262E 03	52.161
13.5	20443	.5364E-07	.1178E-05	.5977E-01	.6745E-05	.1618E 06	.2691E-01	.2246E-01	1.000	.2419	.0612	.2370E 03	.1635E 02	.9689E 01	.3702E 02	1.496	.1314E-04	.1983E-04	.5803	1.498	.2449E 03	52.463
14.0	20464	.4105E-07	.9704E-06	.5551E-01	.5570E-05	.1962E 06	.2492E-01	.1853E-01	1.000	.2409	.0606	.2558E 02	.1650E 02	.1035E 02	.3999E 02	1.498	.1085E-04	.1649E-04	.5757	1.499	.2642E 03	52.750
14.5	20483	.3181E-07	.8073E-06	.5170E-01	.4642E-05	.2395E 06	.2319E-01	.1543E-01	1.000	.2399	.0601	.2753E 03	.1664E 02	.1103E 02	.4305E 02	1.499	.9041E-05	.1383E-04	.5715	1.501	.2842E 03	53.024
15.0	20499	.2492E-07	.6774E-06	.4828E-01	.3901E-05	.2806E 05	.2157E-01	.1296E-01	1.000	.2390	.0596	.2954E 03	.1677E 02	.1173E 02	.4620E 02	1.501	.7600E-05	.1169E 04	.5675	1.503	.3049E 03	53.284
15.5	20514	.1972E-07	.5262E-05	.4520E-01	.3303E-05	.3316E 06	.1861E-01	.1036E-01	1.000	.2381	.0592	.3160E 03	.1690E 02	.1245E 02	.4944E 02	1.502	.6432E-05	.9955E-05	.5637	1.504	.3261E 03	53.535
16.0	20527	.1576E-07	.4875E-05	.4241E-01	.2816E-05	.3893E 06	.1888E-01	.9393E-02	1.000	.2373	.0588	.3373E 03	.1701E 02	.1318E 02	.5278E 02	1.504	.5483E-05	.8532E-05	.5601	1.505	.3479E 03	53.776
16.5	20539	.1270E-07	.4177E-06	.3989E-01	.2415E-05	.4541E 06	.1773E-01	.8006E-02	1.000	.2366	.0584	.3591E 03	.1713E 02	.1393E 02	.5620E 02	1.505	.4704E-05	.7358E-05	.5567	1.507	.3704E 03	54.007
17.0	20550	.1031E-07	.3597E-06	.3759E-01	.2082E-05	.5270E 06	.1669E-01	.6898E-02	1.000	.2359	.0580	.3815E 03	.1723E 02	.1470E 02	.5973E 02	1.506	.4055E-05	.6375E-05	.5535	1.508	.3935E 03	54.231
17.5	20560	.8421E-08	.3144E-01	.3549E-01	.1840E-05	.6086E 06	.1573E 01	.5973E-02	1.000	.2352	.0577	.4047E 03	.1734E 02	.1548E 02	.6336E 02	1.508	.3515E-05	.5582E-05	.5504	1.509	.4174E 03	54.447
18.0	20569	.6926E-08	.2708E-06	.3356E 06	.1570E-05	.6959E 06	.1486E 01	.5197E-02	1.000	.2347	.0574	.4283E 03	.1744E 02	.1628E 02	.6709E 02	1.509	.3058E 05	.4853E 05	.5474	1.510	.4415E 03	54.657
18.5	20578	.5727E-08	.2364E-06	.3179E-01	.1372E-05	.8009E 06	.1405E-01	.4539E-02	1.000	.2340	.0570	.4527E 03	.1754E 02	.1710E 02	.7093E 02	1.510	.2679E 05	.4261E 05	.5445	1.511	.4667E 03	54.860
19.0	20585	.4762E-08	.2072E-06	.3016E 01	.1203E-05	.9135E 06	.1331E 01	.3980E-02	1.000	.2335	.0567	.4776E 03	.1763E 02	.1793E 02	.7487E 02	1.511	.2344E 05	.3754E 05	.5417	1.513	.4923E 03	55.059
19.5	20593	.3979E-08	.1822E-06	.2865E-01	.1059E-05	.1038E 07	.1263E-01	.3502E-02	1.000	.2330	.0565	.5031E 03	.1771E 02	.1878E 02	.7893E 02	1.512	.2063E 05	.3317E 05	.5390	1.514	.5184E 03	55.252
20.0	20599	.3338E-08	.1608E-06	.2725E-01	.9349E-05	.1176E 07	.1199E-01	.3090E-02	1.000	.2324	.0562	.5295E 03	.1781E 02	.1965E 02	.8311E 02	1.513	.1821E-05	.2942E-05	.5364	1.515	.5456E 03	55.441
20.5	20605	.2813E-08	.1423E-06	.2595E-01	.8278E-05	.1329E 07	.1140E 01	.2735E-02	1.000	.2319	.0559	.5565E 03	.1789E 02	.2054E 02	.8714E 02	1.514	.1612E-05	.2614E-05	.5339	1.516	.5732E 03	56.225
21.0	20611	.2381E-08	.1263E-06	.2474E-01	.7353E-05	.1479E 07	.1086E-01															

Table I continued

$T_t = 9000^\circ\text{K}$ $P_t = 1000 \text{ atmospheres}$ $\rho_t = 24.12 \text{ atmospheres}$ $H_t = 197.21 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.258$ $S/R_t = 34.967$

M	U	P/P_t	ρ/ρ_t	T/T_t	q/q_t	A/A^*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9977	6157	.5662E 00	.6211E 00	.9261E 00	.3367E 00	.1000E 01	.9039E 00	.7445E 04	1.238													
2.0	10982	.1307E 00	.1832E 00	.7522E 00	.3158E 00	.1901E 01	.6942E 00	.3916E 04	1.193	.5403	.3114	.4328E 01	.3211E 01	.1273E 01	.1398E 01	1.263	.6716E 00	.6795E 00	.9794	1.270	.5139E 01	35.470
2.5	12748	.5248E-01	.8657E-01	.6516E 00	.2011E 00	.3465E 01	.5879E 00	.2148E 04	1.170	.4608	.2276	.6921E 01	.4394E 01	.1442E 01	.1665E 01	1.278	.4117E 00	.4227E 00	.9547	1.283	.7845E 01	36.094
3.0	14080	.2093E-01	.4102E-01	.5594E 00	.1163E 00	.6621E 01	.4973E 00	.1125E 04	1.147	.4316	.1832	.1008E 02	.5458E 01	.1637E 01	.1977E 01	1.294	.2332E 00	.2438E 00	.9269	1.298	.1114E 02	36.827
3.5	15045	.8949E-02	.2045E-01	.4904E 00	.5617E-01	.1243E 02	.4261E 01	.5989E 00	1.123	.3827	.1346E 02	.6361E 01	.1817E 01	.2313E 01	1.308	.1313E 00	.1400E 00	.8999	1.312	.1468E 02	37.575	
4.0	15852	.3725E-02	.9824E-02	.4352E 00	.3530E-01	.2455E 02	.3628E 00	.3032E 03	1.096	.3591	.1382	.1733E 02	.7237E 01	.1985E 01	.2723E 01	1.322	.6966E-01	.7585E-01	.8712	1.326	.1870E 02	38.411
4.5	16549	.1499E-02	.4529E-02	.3893E 00	.1773E-01	.5102E 02	.3056E 00	.1459E 03	1.069	.3393	.1234	.2174E 02	.8106E 01	.2145E 01	.3237E 01	1.337	.3485E-01	.3889E-01	.8412	1.340	.2325E 02	39.333
5.0	17153	.5583E-02	.2019E-02	.3490E 00	.8493E-02	.1104E 03	.2540E 00	.6742E 02	1.045	.3227	.1114	.2679E 02	.8973E 01	.2309E 01	.3901E 01	1.351	.1666E-01	.1908E-01	.8108	1.354	.2846E 02	40.326
5.5	17677	.2239E-03	.8829E-03	.3115E 00	.3945E-02	.2450E 03	.2077E 00	.3039E 02	1.024	.3087	.1018	.3265E 02	.9825E 01	.2494E 01	.4775E 01	1.365	.7721E-02	.9097E-02	.7808	1.367	.3449E 02	41.371
6.0	18126	.8471E-04	.3863E-03	.2734E 00	.1814E-02	.5462E 03	.1670E 00	.1009	.2696	.0939	.3981E 02	.1656E 02	.2738E 01	.5954E 01	1.377	.3547E-02	.4300E-02	.7522	1.380	.4187E 02	42.439	
6.5	18485	.3357E-04	.1802E-03	.2339E 00	.8802E-03	.1148E 04	.1337E 00	.6484E 01	1.002	.2674	.0878	.4882E 02	.1139E 02	.3094E 01	.7432E 01	1.388	.1716E-02	.2138E-02	.7268	1.390	.5118E 02	43.443
7.0	18724	.1608E-04	.1005E-03	.2011E 00	.5039E-03	.2031E 02	.1111E 00	.3665E 01	1.000	.2811	.0838	.5842E 02	.1193E 02	.3507E 01	.8947E 01	1.396	.9826E-03	.1248E-02	.7081	1.398	.6111E 02	44.221
7.5	18890	.8860E-05	.6332E-04	.1760E 00	.3230E-03	.3197E 04	.5952E-01	.2329E 01	1.000	.2766	.0810	.6860E 02	.1235E 02	.3928E 01	.1044E 01	1.402	.6292E-03	.8125E-03	.6938	1.404	.7102E 02	44.845
8.0	19024	.5111E-05	.4155E-04	.1547E 00	.2150E-03	.4838E 04	.8242E-01	.1539E 01	1.000	.2729	.0786	.7850E 02	.1272E 02	.4387E 01	.1206E 02	1.407	.4185E-03	.5844E-03	.6810	1.409	.8188E 02	45.419
8.5	19124	.3193E-05	.2905E-04	.1382E 00	.1519E-03	.6889E 04	.7272E-01	1.000	.2699	.0768	.8883E 02	.1302E 02	.4834E 01	.1368E 02	1.412	.2956E-03	.3923E 03	.6704	1.414	.9258E 02	45.909	
9.0	19211	.2024E-05	.2057E-04	.1237E 00	.1085E-03	.9677E 04	.6430E-01	.7693E 00	1.000	.2672	.0752	.1002E 03	.1330E 02	.5321E 01	.1547E 02	1.416	.2111E-03	.2836E-03	.6605	1.418	.1043E 03	46.386
9.5	19283	.1318E-05	.1490E-04	.1113E 00	.7919E-04	.1331E 05	.5720E-01	.5592E 00	1.000	.2649	.0738	.1123E 03	.1356E 02	.5839E 01	.1739E 02	1.419	.1539E-03	.2092E-03	.6513	1.421	.1168E 03	46.833
10.0	19345	.8793E-06	.1100E-04	.1006E 00	.5858E-04	.1798E 05	.5151E-01	.4142E 04	1.000	.2628	.0725	.1521E 03	.1379E 02	.6374E 01	.1945E 02	1.423	.1144E-03	.1570E-03	.6429	1.425	.1301E 03	47.256
10.5	19398	.5983E-06	.8255E-05	.9116E-01	.4441E-04	.2388E 05	.4595E-01	.3117E 00	1.000	.2608	.0714	.1388E 03	.1401E 02	.6947E 01	.2165E 02	1.426	.8631E-04	.1197E-03	.6351	1.428	.1434E 03	47.657
11.0	19443	.4165E-06	.6313E-05	.8299E-01	.3116E-04	.4515E-01	.2390E 00	.2590	1.000	.2590	.1539E 03	.1422E 02	.7546E 01	.2398E 02	1.429	.6631E-04	.9284E-04	.6279	1.431	.1592E 03	48.034	
11.5	19482	.2954E-06	.4902E-05	.7580E-01	.2660E-04	.3767E-01	.1859E 00	1.000	.2575	.0694	.1685E 03	.1440E 02	.8174E 01	.2642E 02	1.431	.5167E-04	.7299E-04	.6213	1.433	.1749E 03	48.391	
12.0	19515	.2137E-06	.3866E-05	.6951E-01	.2105E-04	.5068E 00	.3435E-01	.1469E 00	1.000	.2560	.0686	.1845E 03	.1485E 02	.8827E 01	.2898E 02	1.434	.4090E-04	.5826E-04	.6151	1.436	.1914E 03	48.726
12.5	19545	.1570E-06	.3069E-05	.6394E-01	.1687E-04	.6335E-05	.3145E-01	.1175E 00	1.000	.2547	.0678	.2013E 03	.1474E 02	.9507E 01	.3165E 02	1.436	.3278E-04	.4705E-04	.6094	1.438	.2088E 03	49.044
13.0	19570	.1174E-06	.2501E-05	.5903E-01	.1369E-04	.7814E 05	.2893E-01	.9527E-01	1.000	.2534	.0671	.2187E 03	.1490E 02	.1021E 02	.3441E 02	1.438	.2660E-04	.3847E-04	.6041	1.440	.2276E 03	49.344
13.5	19592	.8994E-07	.2048E-05	.5469E-01	.1124E-04	.9593E 05	.2672E-01	.7812E-01	1.000	.2523	.0665	.2566E 03	.1509E 02	.1093E 02	.3727E 02	1.440	.3179E-04	.5951	1.442	.2452E 03	49.629	
14.0	19612	.6843E-07	.1634E-06	.5081E-01	.2476E-04	.6196E-01	.1766E-01	.1000	.2513	.0659	.2553E 03	.1517E 02	.1167E 02	.4021E 02	1.442	.1810E-04	.2652E-04	.5945	1.444	.2645E 03	49.899	
14.5	19630	.5322E-07	.1414E-05	.4735E-01	.7789E-05	.1378E 06	.2302E-01	.5403E-01	1.000	.2504	.0654	.2745E 02	.1243E 02	.4325E 02	.1444	.1513E-04	.2231E-02	.5901	1.446	.2942E 03	50.158	
15.0	19645	.4184E-07	.1190E-05	.4424E-01	.6564E-05	.1636E 06	.2147E-01	.4550E-01	1.000	.2495	.0649	.2943E 02	.1541E 02	.1322E 02	.4436E 02	1.445	.1275E-04	.1891E-04	.5859	1.447	.3047E 03	50.405
15.5	19659	.3323E-07	.1080E-05	.4144E-01	.5572E-05	.1929E 06	.2008E-01	.3860E 01	1.000	.2487	.0644	.3148E 02	.1552E 02	.1401E 02	.4960E 02	1.447	.1082E-04	.1615E-04	.5820	1.449	.3258E 03	50.642
16.0	19671	.2661E-07	.8662E-06	.3890E-01	.4759E-05	.2256E 01	.1882E-01	.3129E 01	1.000	.2479	.0640	.3357E 02	.1563E 02	.1483E 02	.5292E 02	1.448	.9244E-05	.1387E-04	.5783	1.450	.3474E 03	50.871
16.5	19681	.2147E-07	.7378E-06	.3666E-01	.4087E-05	.2663E 01	.1766E-01	.3574E 01	1.000	.2471	.0636	.3574E 02	.1573E 02	.1567E 02	.5364E 02	1.450	.7939E-05	.1197E-04	.5748	1.452	.3698E 03	51.092
17.0	19694	.1745E-07	.6362E-06	.3450E-01	.3528E 05	.3052E 06	.1664E-01	.2439E 01	1.000	.2463	.0632	.4274E 02	.1579E 02	.1659E 02	.5986E 02	1.451	.6853E-05	.1038E-04	.5714	1.453	.3928E 03	51.305
17.5	19703	.1427E-07	.5511E-06	.3258E-01	.3050E-05	.3522E 06	.1566E-01	.2114E-01	1.000	.2455	.0628	.4273E 02	.1593E 02	.1740E 02	.6348E 02	1.452	.5942E-05	.9050E-05	.5681	1.454	.4164E 03	51.512
18.0	19712	.1175E-07	.4795E-06	.3061E-01	.2664E-05	.4046E 06	.1484E-01	.1940E 01	1.000	.2449	.0624	.4261E 02	.1602E 02	.1830E 02	.6722E 02	1.454	.5174E-05	.7615E-05	.5650	1.455	.4405E 03	51.714
18.5	19720	.9722E-08	.4189E-06	.2919E-01	.2220E-05	.4629E 06	.1402E-01	.1608E-01	1.000	.2440	.0620	.4503E 02	.1611E 02	.1921E 02	.7106E 02	1.455	.4525E-05	.6954E-05	.5620	1.456	.4654E 03	51.910
19.0	19727	.8084E-08	.3672E-06	.2769E-01	.2043E-05	.3279E 06	.1328E-01	.1410E-01	1.000	.2436	.0617	.4751E 02	.1619E 02	.2015E 02	.7502E 02	1.456	.3969E-05	.6126E-05	.5591	1.458	.4909E 03	52.101
19.5	19734	.6752E-08	.3229E-06	.2630E-01	.1798E-05	.6001E 06	.1259E-01	.1241E-01	1.000	.2429	.0614	.5008E 03	.1629E 02	.2111E 02	.7910E 02	1.457	.3494E-05	.5147E-05	.5563	1.459	.5175E 03	52.287
20.0	19740	.5668E-08	.2650E-06	.2502E-01	.1589E-05	.6189E-05	.1095E-01	.1095E-01	1.000	.2425	.0611	.5268E 03	.1636E 02	.2208E 02	.6329E 02	1.458	.3085E-05	.5326E-05	.5510	1.460	.5444E 03	52.469
20.5	19746	.4780E-08	.2523E-06	.2385E-01	.1407E-05	.6778E-06	.1139E-01	.1095E-02	1.000	.2419	.0608	.5593E 03	.1644E 02	.2308E 02	.8759E 02	1.459	.2743E-05	.5510	1.461	.5719E 03	52.646	
21.0	19752	.4048E-08	.2241E-06	.2272E-01	.1250E-05	.8641E 06	.1083E-01	.8616E-02	1.000	.2414	.0605	.5809E 03	.1652E 02	.2409E 02	.							

Table I, continued

$T_t = 9000^{\circ}\text{K}$ $p_t = 2000$ atmospheres $\rho_t = 50.08$ atmospheres $H_t = 183.46 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.212$ $S/R_t = 33.618$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9975																						
0.9975	6060.	.5633E 00	.6209E 00	.9196E 00	.3386E 00	.1000E 01	.8999E 00	.1521E 05	1.195													
2.0	10744.	.1300E 00	.1858E 00	.7319E 00	.3184E 00	.1885E 01	.6854E 00	.8071E 04	1.158	.5438	.3159	.4352E 01	.3165E 01	.1307E 01	.1413E 01	.1.218	.6743E 00	.6810E 00	.9806	1.223	.5188E 01	34.097
2.5	12404.	.5347E-01	.9029E-01	.6311E 00	.2042E 00	.3360E 01	.5807E 00	.4528E 04	1.137	.4675	.2341	.6908E 01	.4272E 01	.1491E 01	.1693E 01	1.233	.4205E 00	.4300E 00	.9577	1.237	.7865E 01	34.678
3.0	13643.	.2221E-01	.4419E-01	.5466E 00	.1221E 00	.6243E 01	.4927E 00	.2437E 04	1.114	.4210	.1903	.9001E 01	.5255E 01	.1681E 01	.1992E 01	1.248	.2443E 00	.2536E 00	.9322	1.252	.1100E 02	35.353
3.5	14616.	.9239E-02	.2141E-01	.4801E 00	.6788E-01	.1203E 00	.4177E 00	.0489	1.2698	.3888	.1625	.1331E 02	.6155E 01	.1863E 01	.2357E 01	1.264	.1346E 00	.1422E 00	.9050	1.267	.1457E 02	36.103
4.0	15428.	.3751E-02	.1004E-01	.4252E 00	.3547E-01	.2318E 00	.3513E 00	.0364	1.064	.3643	.1425	.1722E 02	.7020E 01	.2041E 01	.2809E 01	1.279	.6977E-01	.7524E-01	.8760	1.282	.1860E 02	36.938
4.5	16123.	.1473E-02	.4540E-02	.3775E 00	.1752E-01	.5142E 02	.2915E 00	.1041	.3437	.1270	.2175E 02	.7871E 01	.2223E 01	.3391E 01	1.295	.3435E-01	.3790E-01	.8462	1.298	.2331E 02	37.852	
5.0	16711.	.5719E-03	.2027E-02	.3343E 00	.8404E-02	.1111E 03	.2389E 00	.1570E 03	1.022	.3277	.1150	.2701E 02	.8693E 01	.2426E 01	.4144E 01	1.309	.1644E-01	.1859E-01	.8166	1.312	.2878E 02	38.812
5.5	17215.	.2173E-03	.8961E-03	.2974E 00	.3942E-02	.2440E 03	.1923E 00	.6236E 02	1.008	.3138	.1054	.3344E 01	.9489E 01	.2687E 01	.5153E 01	1.323	.7696E-02	.8932E-02	.7876	1.328	.3541E 02	39.813
6.0	17609.	.8770E-04	.4220E-03	.2495E 00	.1926E-02	.5028E 03	.1549E 00	.3024E 02	1.002	.3032	.0981	.4123E 02	.1019E 01	.3038E 01	.6402E 01	1.334	.3813E-02	.4535E-02	.7620	1.337	.4348E 02	40.747
6.5	17886.	.2076E-05	.2318E-03	.2138E 00	.1101E-02	.9078E 00	.1676E 02	1.000	.2959	.0932	.4977E 02	.1073E 02	.3453E 01	.7745E 01	1.343	.2145E 02	.2600E-02	.7419	1.346	.5234E 02	41.520	
7.0	18083.	.2156E-04	.1407E-03	.1856E 00	.6831E-03	.1479E 04	.1089E 00	.1029E 02	1.000	.2906	.0896	.5867E 02	.1116E 02	.3892E 01	.9129E 01	1.350	.1232E-02	.1638E-02	.7257	1.353	.6157E 02	42.165
7.5	18237.	.1211E-04	.9032E-04	.1625E 00	.4459E-03	.2285E 04	.9355E 01	.6659E 01	1.000	.2862	.0867	.6822E 02	.1153E 02	.4362E 01	.1062E 02	1.356	.8660E-03	.1085E-02	.7118	1.359	.7149E 02	42.744
8.0	18365.	.7283E-05	.6130E-04	.1439E 00	.3066E-03	.8175E-01	.4549E 04	.1.000	.2827	.0845	.7807E 02	.1184E 02	.4842E 01	.1215E 02	1.362	.5951E-03	.7555E-03	.6998	1.364	.8171E 02	43.254	
8.5	18454.	.4513E-05	.4264E-04	.1282E 00	.2155E-03	.4785E 04	.7189E-01	.3181E 01	1.000	.2797	.0825	.8864E 02	.1212E 02	.5352E 01	.1382E 02	1.366	.4182E-03	.5376E-03	.6888	1.368	.9267E 02	43.736
9.0	18536.	.2076E-05	.3035E-04	.1148E 00	.6689E-04	.6360E-01	.2274E 01	1.000	.2769	.0808	.9995E 02	.1238E 02	.5892E 01	.1563E 02	1.370	.3003E-02	.3905E-03	.6787	1.372	.1044E 03	44.190	
9.5	18605.	.1880E-05	.2206E-03	.1032E 00	.1124E-03	.9167E 04	.5658E-01	.1660E 01	1.000	.2744	.0793	.1120E 02	.1262E 02	.6463E 01	.1757E 01	1.374	.2198E-03	.2891E-03	.6695	1.376	.1169E 03	44.618
10.0	18664.	.1256E-05	.1623E-04	.9317E-01	.8444E-04	.1235E 05	.5058E-01	.1232E 01	1.000	.2723	.0779	.1250E 03	.1283E 02	.7070E 01	.1966E 02	1.378	.1637E-03	.2175E-03	.6609	1.380	.1304E 03	45.024
10.5	18714.	.8595E-06	.1233E-04	.8447E-05	.6409E-04	.1631E 05	.5459E-01	.9327E 01	1.000	.2704	.0767	.1387E 03	.1303E 02	.7706E 01	.2186E 02	1.381	.1242E-03	.1667E-03	.6530	1.383	.1445E 03	45.404
11.0	18757.	.6003E-06	.9461E-05	.7686E-01	.4941E-04	.2121E 05	.4110E-01	.7174E 00	1.000	.2687	.0757	.1531E 03	.1322E 02	.8374E 01	.2420E 02	1.384	.9576E-04	.1297E-03	.6457	1.386	.1595E 03	45.764
11.5	18794.	.4282E-06	.7387E-05	.7023E-01	.3837E-04	.2711E 05	.3733E-01	.5612E 00	1.000	.2670	.0747	.1688E 03	.1339E 02	.9070E 01	.2664E 02	1.385	.7505E-04	.1025E-03	.6390	1.388	.1752E 03	46.102
12.0	18826.	.3107E-06	.5846E-05	.6439E-01	.3076E-04	.3419E 05	.3406E-01	.4449E 00	1.000	.2655	.0738	.1843E 03	.1355E 02	.9797E 01	.2920E 02	1.389	.5960E-04	.8204E-04	.6328	1.391	.1918E 03	46.422
12.5	18853.	.2296E-06	.4693E-05	.5927E-01	.2476E-04	.4253E 05	.3123E-01	.3577E 00	1.000	.2643	.0730	.2009E 03	.1369E 02	.1055E 02	.3185E 02	1.391	.4799E-04	.6656E-04	.6270	1.393	.2090E 03	46.724
13.0	18877.	.1724E-06	.3815E-06	.5475E-01	.2018E-04	.5226E 05	.2876E-01	.2911E 00	1.000	.2631	.0723	.2181E 03	.1388E 02	.1132E 02	.3460E 02	1.393	.3910E-04	.5461E-04	.6216	1.395	.2268E 03	47.009
13.5	18899.	.1313E-06	.3135E-05	.5074E-01	.1662E-04	.6352E 05	.2658E-01	.2395E 00	1.000	.2619	.0716	.2360E 03	.1396E 02	.1212E 02	.3744E 02	1.395	.3221E-04	.4529E-04	.6165	1.397	.2453E 03	47.280
14.0	18917.	.1012E-06	.2600E-05	.4717E-01	.1381E-04	.7650E 05	.2465E-01	.1989E 00	1.000	.2609	.0710	.2544E 02	.1408E 02	.1294E 02	.4037E 02	1.397	.2676E-04	.3788E-04	.6118	1.399	.2643E 03	47.539
14.5	18934.	.7896E-07	.2176E-05	.4397E-01	.1158E-04	.9136E 05	.2293E-01	.1665E 00	1.000	.2600	.0705	.2795E 03	.1419E 02	.1378E 02	.4339E 02	1.399	.2243E-04	.3194E-04	.6073	1.401	.2841E 03	47.786
15.0	18949.	.6252E-07	.1835E-05	.4110E-01	.9779E-05	.1082E 06	.2140E-01	.1405E 00	1.000	.2590	.0699	.2932E 03	.1430E 02	.1463E 02	.4650E 02	1.401	.1895E-04	.2714E-04	.6031	1.403	.3045E 03	48.022
15.5	18962.	.4951E-07	.1557E-05	.3851E-01	.8313E-05	.1274E 06	.2002E-01	.1194E 00	1.000	.2581	.0694	.3124E 03	.1444E 02	.1551E 02	.4971E 02	1.402	.1611E-04	.2320E-04	.5991	1.404	.3254E 03	48.250
16.0	18974.	.3970E-07	.1330E-05	.3616E-01	.7107E-05	.1491E 06	.1877E-01	.1020E 00	1.000	.2573	.0689	.3343E 03	.1451E 02	.1642E 02	.5302E 02	1.403	.1377E-04	.1994E-04	.5952	1.406	.3469E 03	48.470
16.5	18985.	.3208E-07	.1142E-05	.3403E-01	.6110E-06	.1737E 06	.1674E-01	.1874E-01	1.000	.2565	.0685	.3558E 02	.1460E 02	.1734E 02	.5643E 02	1.405	.1184E-04	.1723E-05	.5916	1.407	.3691E 03	48.683
17.0	18995.	.2609E-07	.9852E-06	.3208E-01	.5277E-05	.2011E 06	.1660E-01	.7565E-01	1.000	.2558	.0681	.3778E 03	.1469E 02	.1828E 02	.5995E 02	1.407	.1022E-04	.1495E-04	.5880	1.409	.3919E 03	48.889
17.5	19004.	.2136E-07	.8539E-06	.3030E-01	.4578E-05	.2319E 06	.1566E-01	.6560E-01	1.000	.2550	.0677	.4006E 03	.1478E 02	.1925E 02	.6358E 02	1.408	.8872E-05	.1304E-04	.5847	1.410	.4154E 03	49.089
18.0	19013.	.1759E-07	.7433E-06	.2866E-01	.3988E-05	.2663E 06	.1479E-01	.5713E-01	1.000	.2543	.0673	.4240E 03	.1487E 02	.2024E 02	.6731E 02	1.409	.7730E-05	.1142E-04	.5814	1.411	.4396E 03	49.283
18.5	19020.	.1455E-07	.6492E-06	.2715E-01	.3486E-05	.3048E 06	.1399E-01	.4992E-01	1.000	.2537	.0669	.4480E 03	.1495E 02	.2125E 02	.7117E 02	1.411	.6757E-05	.1002E-04	.5783	1.412	.4644E 03	49.473
19.0	19028.	.1210E-07	.5690E-06	.2576E-01	.3058E-05	.3476E 06	.1252E-01	.2377E-01	1.000	.2530	.0665	.4728E 03	.1503E 02	.2228E 02	.7515E 02	1.412	.5927E-05	.8831E-05	.5753	1.413	.4899E 03	49.688
19.5	19034.	.1011E-07	.5006E-06	.2447E-01	.2692E-05	.3949E 06	.1257E-01	.1825E-01	1.000	.2524	.0662	.4981E 03	.1511E 02	.2334E 02	.7923E 02	1.413	.5219E-05	.7809E-05	.5723	1.415	.5161E 03	49.888
20.0	19040.	.8492E-08	.4420E-06	.2238E-01	.2379E-05	.4472E 06	.1194E-01	.3402E-01	1.000	.2518	.0659	.5241E 03	.1518E 02	.2441E 02	.8342E 02	1.414	.4511E-05	.6928E-05	.5695	1.416	.5429E 03	50.103
20.5	19046.	.7162E-08	.3914E-06	.2217E-01	.2107E-05	.5049E 06	.1135E-01	.3013E 01	1.000	.2511	.0655	.5509E 03	.1526E 02	.2551E 02								

Table I continued

$T_t = 9000^\circ\text{K}$ $P_t = 3000 \text{ atmospheres}$ $\rho_t = 76.65 \text{ atmospheres}$ $H_t = 176.77 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.187$ $S/R_t = 32.891$

M	U	P/P_t	ρ/ρ_t	T/T_t	q/P_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9958	6001	.5626E 00	.6217E 00	.9161E 00	.3392E 00	.1000E 01	.8981E 00	.2309E 05	1.173													
2.0	10618	.1296E 00	.1871E 00	.7222E 00	.1876E 01	.6811E 00	.1229E 05	1.139	.5473	.3183	.4362E 01	.3142E 01	.1323E 01	.1421E 01	1.194	.6753E 00	.6813E 00	.9812	1.199	.5211E 01	33.359	
2.5	12221	.5416E-01	.9223E-01	.6234E 00	.2087E 00	.3310E 01	.5775E 04	1.118	.4703	.2375	.6875E 01	.4211E 01	.1510E 01	.1690E 01	1.209	.4250E 00	.4336E 00	.9594	1.213	.7847E 01	33.917	
3.0	13441	.2256E-01	.4516E-01	.5413E 00	.1236E 00	.6148E 01	.4890E 00	.3756E 04	1.096	.4235	.1933	.9838E 01	.5175E 01	.1701E 01	.2006E 01	1.225	.2470E 00	.2556E 00	.9345	1.228	.1095E 02	34.578
3.5	14413	.9294E-02	.2167E-01	.4749E 00	.6819E-01	.1195E 02	.4123E 00	.1933E 04	1.072	.3914	.1648	.1325E 02	.6059E 01	.1887E 01	.2387E 01	1.241	.1351E 00	.1421E 00	.9075	1.244	.1453E 02	35.324
4.0	15224	.3734E-02	.1007E-01	.4192E 00	.3537E-01	.2433E 02	.3444E 00	.9490E 03	1.050	.3621	.1446	.1712E 02	.6918E 01	.2076E 01	.2864E 01	1.257	.7018E-01	.7508E-01	.8803	1.261	.1880E 02	36.161
4.5	15909	.1453E-02	.4558E-02	.3702E 00	.1748E-01	.5145E 02	.2841E 00	.4488E 03	1.029	.3459	.1290	.2181E 02	.7753E 01	.2275E 01	.3478E 01	1.273	.3426E-01	.3754E-01	.8495	1.276	.2342E 02	37.051
5.0	16490	.5626E-03	.2032E-02	.3242E 00	.8372E-02	.1113E 03	.2308E 00	.2074E 03	1.014	.3300	.1169	.2728E 02	.8551E 01	.2511E 01	.4288E 01	1.288	.1636E-01	.1835E-01	.8201	1.290	.2908E 02	37.997
5.5	16963	.2211E-03	.9347E-03	.2796E 00	.4074E-02	.2353E 03	.1860E 00	.9812E 02	1.004	.3170	.1077	.3388E 02	.9283E 01	.2817E 01	.5324E 01	1.301	.7943E-02	.9124E-02	.7928	1.304	.3593E 02	38.934
6.0	17321	.9450E-04	.4703E-03	.2384E 00	.2127E-02	.4580E 03	.1519E 02	.5041E 02	1.001	.3075	.1010	.4166E 02	.9901E 01	.3210E 01	.6551E 01	1.312	.4159E-02	.4882E-02	.7694	1.314	.4401E 02	39.780
6.5	17572	.4642E-04	.2687E-03	.2051E 00	.1257E-02	.7902E 03	.1265E 00	.2922E 02	1.000	.3008	.0963	.4993E 02	.1038E 02	.3643E 01	.7838E 01	1.321	.2442E-02	.2919E-02	.7509	1.323	.5260E 02	40.482
7.0	17758	.2510E-04	.1663E-03	.1786E 00	.7970E-03	.1259E 04	.1080E 00	.1833E 02	1.000	.2957	.5859E 02	.1077E 02	.4098E 01	.9186E 01	1.328	.1547E-02	.1877E-02	.7355	1.330	.6116E 02	41.087	
7.5	17908	.1411E-04	.1073E-03	.1561E 00	.5212E-03	.1942E 04	.9286E-01	.1189E 02	1.000	.2912	.0899	.6825E 02	.1112E 02	.4601E 01	.1069E 01	1.334	.1011E-02	.1245E-02	.7215	1.336	.7165E 02	41.654
8.0	18021	.8581E-05	.7350E-04	.1386E 00	.3616E-03	.2817E 04	.8135E-01	.8197E 01	1.000	.2878	.0876	.7789E 02	.1141E 02	.5098E 01	.1221E 02	1.339	.7008E-03	.8743E-03	.7097	1.341	.8186E 02	42.143
8.5	18118	.5317E-04	.5117E-04	.1234E 00	.2544E-03	.4025E 04	.7150E-01	.5736E 01	1.000	.2848	.0856	.8847E 02	.1168E 02	.5640E 01	.1389E 02	1.343	.4928E-03	.6223E 02	.6987	1.346	.9267E 02	42.616
9.0	18198	.3393E-05	.3649E-04	.1104E 00	.1830E-03	.5620E 04	.6325E-01	.4108E 01	1.000	.2820	.0839	.9979E 02	.1192E 02	.6211E 01	.1571E 02	1.348	.3544E-03	.4527E-03	.6886	1.350	.1044E 03	43.060
9.5	18266	.2221E-05	.2656E-04	.9926E-01	.1342E-03	.7690E 04	.5626E-01	.3002E 01	1.000	.2796	.0823	.1119E 03	.1215E 02	.6817E 01	.1766E 02	1.352	.2599E-03	.3356E-03	.6793	1.354	.1170E 03	43.479
10.0	18323	.1487E-05	.1971E-04	.8958E-01	.1020E-03	.1033E 01	.5031E 01	.2234E 01	1.000	.2774	.0809	.1235E 02	.1249E 02	.7459E 01	.1975E 02	1.355	.1940E-03	.2531E 02	.6707	1.357	.1305E 03	43.875
10.5	18372	.1020E-05	.1491E-04	.8121E-01	.7622E-04	.1362E 05	.4524E-01	.1695E 01	1.000	.2755	.0797	.1385E 03	.1254E 02	.8132E 01	.2197E 02	1.358	.1475E-03	.1942E-03	.6628	1.360	.1446E 03	44.247
11.0	18414	.7143E-06	.1147E-04	.7391E-01	.5895E-01	.1766E 05	.4090E 01	.1307E 01	1.000	.2737	.0786	.1593E 03	.1272E 02	.8838E 01	.2430E 02	1.361	.1140E-03	.1515E-03	.6555	1.363	.1597E 03	44.597
11.5	18449	.5104E-06	.8974E-05	.5752E-01	.4627E-04	.2254E 05	.3717E-01	.1024E 01	1.000	.2722	.0776	.1682E 03	.1288E 02	.9575E 01	.2675E 02	1.364	.8954E-04	.1200E-03	.6487	1.366	.1754E 03	44.927
12.0	18480	.3714E-06	.7120E-05	.6192E-01	.3683E 00	.3393E-01	.8142E 00	.1000	.2707	.0768	.1841E 03	.1303E 02	.1034E 02	.2930E 02	1.367	.7126E-02	.9623E-03	.6424	1.369	.1919E 03	45.239	
12.5	18507	.2752E-06	.5730E-05	.5701E-01	.2279E-04	.3518E 05	.3113E 00	.6562E 00	1.000	.2694	.0760	.2006E 03	.1316E 02	.1113E 02	.3195E 02	1.369	.5751E-04	.7823E-04	.6366	1.371	.2090E 03	45.532
13.0	18531	.2070E-06	.4666E-05	.5268E-01	.2427E-04	.4315E 05	.2867E-01	.5350E 00	1.000	.2682	.0752	.2178E 03	.1330E 02	.1195E 02	.3468E 02	1.371	.4649E-04	.6493E-04	.6312	1.373	.2268E 03	45.811
13.5	18551	.1579E-06	.3840E-05	.4883E-01	.2020E-04	.5238E 05	.2651E 01	.4408E 00	1.000	.2671	.0745	.2355E 03	.1342E 02	.1278E 02	.3751E 02	1.373	.3873E-04	.5340E-04	.6261	1.375	.2452E 03	46.075
14.0	18569	.1220E-06	.3189E-05	.4540E-01	.1666E-04	.2460E 05	.3636E 00	.2460E-01	1.000	.2660	.0739	.2540E 03	.1354E 02	.1365E 02	.4043E 02	1.375	.3223E-04	.4472E-04	.6214	1.377	.2643E 03	46.328
14.5	18586	.9528E-07	.2672E-05	.4243E-01	.1398E-04	.7514E 05	.2290E 01	.3073E 00	1.000	.2650	.0733	.2729E 03	.1365E 02	.1453E 02	.4344E 02	1.377	.2705E-04	.3777E-04	.6168	1.379	.2839E 03	46.569
15.0	18600	.7159E-07	.2255E-05	.3958E-01	.1182E-04	.8895E 05	.2137E 00	.2596E 00	1.000	.2640	.0727	.2925E 03	.1375E 02	.1543E 02	.4655E 02	1.379	.2287E-04	.3211E-04	.6126	1.380	.3042E 03	46.800
15.5	18613	.5984E-07	.1919E-05	.3709E-01	.1005E-04	.1047E 04	.1999E-01	.2206E 00	1.000	.2632	.0722	.3127E 03	.1385E 02	.1636E 02	.4976E 02	1.380	.1945E-04	.2746E-04	.6085	1.382	.3230E 03	47.024
16.0	18625	.4801E-07	.1636E-05	.3484E-01	.8589E-05	.1224E 05	.1785E-01	.1886E 00	1.000	.2624	.0717	.3394E 03	.1394E 02	.1731E 02	.5306E 02	1.382	.1654E-04	.2362E-04	.6046	1.384	.3466E 03	47.240
16.5	18636	.3881E-07	.1405E-07	.3278E-01	.7379E-05	.1425E 05	.1762E 01	.2162E 00	1.000	.2617	.0713	.3594E 03	.1403E 02	.1828E 02	.5647E 02	1.383	.1431E-04	.2041E-04	.6009	1.385	.3687E 03	47.448
17.0	18646	.3158E-07	.1213E-05	.3091E 01	.6387E-05	.1650E 06	.1659E-01	.1399E 00	1.000	.2608	.0708	.3769E 03	.1412E 02	.1927E 02	.6000E 02	1.385	.1236E-04	.1772E-04	.5973	1.386	.3915E 03	47.651
17.5	18655	.2586E-07	.1052E-05	.2919E 01	.5544E-05	.1902E 06	.1564E-01	.1214E 00	1.000	.2601	.0704	.3994E 03	.1420E 02	.2029E 02	.6362E 02	1.386	.1073E-04	.1546E-04	.5939	1.388	.4149E 03	47.847
18.0	18663	.2129E-07	.9155E-06	.2781E-01	.4282E-05	.1284E 06	.1477E 00	.1057E 00	1.000	.2594	.0700	.4228E 03	.1437E 02	.2193E 02	.6736E 02	1.387	.9346E-05	.1353E-05	.5904	1.389	.4200E 03	48.039
18.5	18670	.1761E-07	.7579E-06	.2616E 01	.4222E-05	.12500E 06	.1397E 00	.2957	1.000	.2587	.0696	.4668E 03	.1437E 02	.2240E 02	.7123E 02	1.389	.8168E-05	.1187E-04	.5874	1.390	.4368E 03	48.226
19.0	18677	.1465E-07	.7009E-07	.2482E-01	.2840E 05	.1323E 00	.8100E 00	.2980	1.000	.2582	.0692	.4716E 03	.1445E 02	.2348E 02	.7512E 02	1.390	.7171E-05	.1047E-04	.5843	1.391	.4895E 03	48.407
19.5	18684	.1225E-07	.6168E-06	.2358E 01	.3236E-05	.1255E 06	.7131E 01	.1000	.2574	.0689	.4967E 03	.1452E 02	.2459E 02	.7929E 02	1.391	.6315E-05	.9261E-05	.5813	1.393	.5155E 03	48.584	
20.0	18690	.1029E-07	.5446E-06	.2281E-01	.3660E 06	.1129E 01	.5229E 00	1.000	.2563	.0685	.5226E 03	.1459E 02	.2572E 02	.8194E 02	1.392	.5578E-05	.8214E-05	.5785	1.395	.5621E 03	48.757	
20.5	18695	.8673E-07	.4242E-06	.2243E-01	.2881E-06	.1106E 06	.5129E 01	.5000	1.000	.2553	.0682	.5491E 03	.1466E 02	.2568E 02	.8783E 02	1.393	.4940E-05	.7575	.5757	1.395	.5656E 03	48.926
21.0	18700	.7339E-08	.4278E-06	.2037E 01	.2266E-05	.4664E 06	.1079E 01	.4951E 01	1.000	.2556	.0679	.5767E 03	.1474E									

Table I continued

$T_t = 10000^{\circ}\text{K}$ $p_t = 500 \text{ atmospheres}$ $p_t = 9.43 \text{ atmospheres}$ $H_t = 282.56 \times 10^8 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.448$ $S/R_t = 38.795$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A^*	H/E_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	p_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9997	6953	.5686E 00	.6212E 00	.9353E 00	.3358E 00	.1000E 01	.9144E 00	.3288E 04	1.417													
2.0	12433	.1338E 00	.1816E 00	.7942E 00	.3137E 00	.1914E 01	.7264E 00	.1718E 04	1.344	.5336	.3060	.4254E 01	.3268E 01	.1205E 01	.1341E 01	1.452	.6725E 00	.6830E 00	.9757	1.461	.5026E 01	.39.372
2.5	14520	.5371E -01	.8316E -01	.7181E 00	.1960E 00	.3578E 01	.6269E 00	.9190E 03	1.302	.4498	.2190	.6698E 01	.4565E 01	.1300E 01	.1566E 01	1.470	.4050E 00	.4196E 00	.9459	1.477	.7540E 01	.40.118
3.0	16244	.2004E -01	.3573E -01	.6431E 00	.1054E 00	.7444E 01	.5331E 00	.4417E 03	1.263	.3953	.1700	.9728E 01	.5882E 01	.1401E 01	.1851E 01	1.491	.2137E 00	.2272E 00	.9101	1.496	.1066E 02	.41.068
3.5	17660	.7130E -02	.1481E -01	.5675E 00	.5163E -01	.1652E 02	.4481E 00	.1990E 03	1.228	.3585	.1394	.1346E 02	.7173E 01	.1525E 01	.2208E 01	1.512	.1029E 00	.1128E 00	.8716	1.516	.1444E 02	.42.167
4.0	18791	.2518E -02	.6218E -02	.4878E 00	.2455E -01	.3697E 02	.3751E 00	.8893E 02	1.202	.3312	.1192	.1817E 02	.8389E 01	.1700E 01	.2642E 01	1.531	.4879E -01	.5512E -01	.8348	1.535	.1937E 02	.43.307
4.5	19563	.1038E -02	.3031E -02	.4194E 00	.1297E -01	.7284E 02	.3228E 00	.4513E 02	1.182	.3146	.1071	.2330E 02	.9336E 01	.1908E 01	.3074E 01	1.547	.2562E -01	.2973E -01	.8048	1.550	.2468E 02	.44.300
5.0	20089	.5018E -03	.1669E -02	.3746E 00	.7528E -02	.1289E 03	.2859E 00	.2552E 02	1.162	.3032	.0992	.2803E 02	.1008E 01	.2073E 01	.3473E 01	1.559	.1483E -01	.1761E -01	.7807	1.562	.2956E 02	.45.150
5.5	20562	.2348E -03	.8780E -03	.3404E 00	.4150E -02	.2393E 03	.2518E 00	.1374E 02	1.137	.2924	.0923	.3309E 02	.1084E 02	.2210E 01	.3946E 01	1.574	.8162E -02	.9934E -02	.7556	1.574	.3477E 02	.46.085
6.0	21013	.1024E -03	.4286E -03	.3116E 00	.2116E -02	.4796E 03	.2186E 00	.6855E 01	1.110	.2882	.0858	.3877E 02	.1166E 02	.2329E 01	.4547E 01	1.584	.4157E -02	.5202E 02	.7288	1.587	.4059E 02	.47.152
6.5	21436	.4216E -04	.1969E -03	.2863E 00	.1012E -02	.1023E 04	.1869E 00	.3213E 01	1.082	.2724	.0798	.4515E 02	.1255E 02	.2441E 01	.5932E 01	1.598	.1986E -02	.2562E -02	.7013	1.601	.4711E 02	.48.329
7.0	21824	.1672E -04	.8706E -04	.2632E 00	.4635E -03	.2273E 04	.1572E 00	.1446E 01	1.056	.2632	.0744	.5233E 02	.1344E 02	.6332E 01	.2553E 01	1.611	.9100E -03	.1211E -02	.6740	1.614	.5444E 02	.49.582
7.5	22169	.6571E -05	.3816E -04	.2412E 00	.2097E -03	.5106E 04	.1303E 00	.6439E 01	1.033	.2350	.0697	.6037E 02	.1343E 01	.2679E 01	.7643E 01	1.624	.4116E -03	.5656E 03	.6480	1.626	.6265E 02	.50.867
8.0	22480	.2529E -05	.1655E -04	.2181E 00	.9349E -04	.1161E 05	.1057E 00	.2832E 00	1.015	.2477	.0656	.7007E 02	.1525E 02	.2851E 01	.9422E 01	1.635	.1835E -03	.2602E -03	.6233	1.638	.7255E 02	.52.185
8.5	22755	.9536E -06	.7251E -05	.1898E 00	.4197E -04	.2618E 05	.8373E -01	.1256E 00	1.003	.2411	.0620	.8354E 02	.1613E 02	.3155E 01	.1190E 02	1.646	.8233E -04	.1204E 03	.6003	1.648	.8633E 02	.53.502
9.0	22992	.4562E -06	.1842E -05	.1641E 00	.2365E -04	.4689E 05	.6943E -01	.7021E -01	1.000	.2367	.0597	.9847E 02	.1676E 02	.3555E 01	.1435E 02	1.654	.4637E -04	.6934E -04	.5848	1.656	.1016E 03	.54.450
9.5	23041	.2695E -06	.2678E -05	.1457E 00	.1590E -04	.7000E 05	.6051E -01	.4676E -01	1.000	.2340	.0582	.1121E 03	.1718E 02	.3939E 01	.1647E 02	1.658	.3116E -04	.4730E -04	.5744	1.660	.1156E 03	.55.108
10.0	23121	.1754E -06	.1930E -05	.1316E 00	.1154E -05	.9679E 05	.5401E -01	.3397E -01	1.000	.2319	.0571	.1250E 03	.1751E 02	.4295E 01	.1846E 02	1.662	.2266E -04	.3473E -04	.5663	1.664	.1289E 03	.55.642
10.5	23187	.1180E -06	.1429E -05	.1196E 00	.8586E -05	.1304E 05	.4857E -01	.2521E -01	1.000	.2301	.0562	.1383E 03	.1780E 02	.4665E 01	.2059E 02	1.666	.1582E -04	.2612E -04	.5590	1.667	.1424E 03	.56.134
11.0	23245	.8084E -07	.1073E -05	.1091E 00	.6483E -05	.1731E 06	.4384E -01	.1899E 01	1.000	.2285	.0553	.1525E 03	.1808E 02	.5054E 01	.2274E 02	1.669	.1269E -04	.1992E 03	.5522	1.670	.1570E 03	.56.604
11.5	23295	.16.5638E -07	.8182E -07	.9975E -01	.4946E 05	.2366E -01	.3973E -01	.1431E 03	1.000	.2269	.0545	.1674E 03	.2042E 01	.5426E 01	.2510E 02	1.672	.9717E -05	.1540E -04	.5459	1.673	.1724E 03	.57.050
12.0	23338	.4002E -07	.6320E -06	.9154E -01	.3854E -05	.2924E 06	.3615E -01	.1124E 01	1.000	.2255	.0538	.1832E 03	.1856E 02	.5088E 01	.2759E 02	1.674	.7544E -05	.1207E -04	.5400	1.676	.1885E 03	.57.474
12.5	23376	.2881E -07	.4954E -06	.8420E -01	.3026E -05	.3790E 06	.3299E -01	.0818E -02	1.000	.2243	.0532	.1998E 03	.1801E 02	.6336E 01	.3032E 02	1.677	.5922E -05	.9557E -05	.5345	1.679	.2059E 03	.57.880
13.0	23410	.2110E -07	.3932E 06	.7770E -06	.2409E -05	.4693E 06	.3024E -01	.1005E -02	1.000	.2231	.0526	.2172E 03	.1902E 02	.5801E 01	.3298E 02	1.679	.4712E -05	.7668E -05	.5294	1.681	.2233E 03	.58.284
13.5	23439	.1567E -07	.3156E -06	.7189E -01	.1938E -05	.5839E 06	.2781E -01	.1899E -01	1.000	.2228	.0520	.5631E 02	.1923E 02	.5200E 01	.2278E 02	1.681	.3587E 03	.6220E 02	.5246	1.683	.2402E 03	.58.629
14.0	23463	.1181E -07	.2563E 06	.6666E -06	.4475E -01	.1578E 05	.7182E -01	.2056E -01	1.000	.2210	.0515	.2547E 03	.2078E 02	.5141E 01	.2778E 01	1.683	.3087E 05	.5099E 05	.5201	1.685	.2614E 03	.58.976
14.5	23488	.9012E -08	.2103E -06	.6203E -01	.1297E -05	.8743E 06	.2376E -01	.1000	.2200	.0510	.2741E 03	.1959E 02	.8304E 01	.4198E 02	1.685	.2528E -05	.4222E -05	.5159	1.687	.2816E 03	.59.306	
15.0	23508	.6957E -08	.1742E -05	.5783E -01	.1076E -05	.1055E 07	.2207E -01	.3116E -02	1.000	.2192	.0506	.2946E 03	.1976E 02	.8840E 01	.4520E 02	1.687	.2105E -05	.3526E -05	.5120	1.689	.3206E 03	.59.621
15.5	23526	.5437E -08	.1456E -05	.5450E -01	.9012E 06	.1261E 07	.2056E -01	.2608E -02	1.000	.2183	.0502	.3158E 03	.1992E 02	.9390E 01	.4852E 02	1.689	.1763E -05	.2971E -05	.5084	1.690	.3242E 03	.59.921
16.0	23542	.4297E -08	.1228E -06	.5056E -01	.7610E -06	.1494E 07	.1921E -01	.2201E -02	1.000	.2175	.0498	.3375E 03	.2007E 02	.9953E 01	.5192E 02	1.690	.1489E -05	.2524E -05	.5049	1.692	.3466E 03	.60.207
16.5	23557	.3428E -08	.1042E -06	.4757E -01	.6473E 06	.1757E 07	.1800E -01	.1872E 02	1.000	.2168	.0495	.3599E 03	.2020E 02	.1053E 02	.5542E 02	1.692	.1267E -05	.2159E 02	.52017	1.693	.3695E 03	.60.481
17.0	23570	.2760E -08	.8226E -06	.4474E -01	.5544E -06	.2053E 07	.1691E -01	.1601E -02	1.000	.2161	.0492	.3830E 03	.2034E 02	.1112E 02	.5901E 02	1.693	.1085E -05	.1859E -05	.4986	1.695	.3930E 03	.60.744
17.5	23582	.2240E -08	.6782E -07	.4221E -01	.4776E -06	.2384E 07	.1591E -01	.1379E -02	1.000	.2156	.0489	.4065E 03	.2046E 02	.1172E 02	.6259E 02	1.694	.9344E -06	.1610E -05	.4956	1.696	.4172E 03	.60.997
18.0	23593	.1821E -08	.6648E -07	.3988E -01	.4137E -06	.2754E -06	.1501E -01	.1194E -02	1.000	.2149	.0486	.4209E 03	.2059E 02	.1234E 02	.6647E 02	1.696	.8093E -05	.1401E 02	.4928	1.697	.4420E 03	.61.240
18.5	23603	.1508E -08	.5785E -07	.3774E -01	.3602E -06	.3164E 07	.1419E -01	.1039E -02	1.000	.2144	.0483	.4556E 03	.2071E 02	.1297E 02	.7033E 02	1.697	.7046E -06	.1226E -05	.4901	1.698	.4673E 03	.61.476
19.0	23612	.1250E -08	.3578E -01	.3151E -06	.3618E 07	.1343E -01	.9087E -03	1.000	.2138	.0480	.4810E 03	.2082E 02	.1361E 02	.7429E 02	1.698	.6167E -06	.1078E -05	.4876	1.699	.4935E 03	.61.702	
19.5	23620	.1041E -08	.4438E -06	.3397E -01	.2769E -06	.4121E 07	.1273E -01	.1797E -03	1.000	.2133	.0478	.5071E 03	.2093E 02	.1426E 02	.7435E 02	1.699	.5415E -06	.9504E -06	.4851	1.701	.5201E 03	.61.923
20.0	23628	.8721E -09	.3209E -07	.3230E -01	.2440E -06	.4676E 07	.1209E -01	.2039E -03	1.000	.2127	.0475	.5339E 03	.2104E 02	.1493E 02	.8251E 02	1.700	.4774E -06	.8414E -06	.4828	1.702	.5474E 03	.62.138
20.5	23635	.7342E -09	.3457E -07	.3075E -01	.2159E -06	.5282E 07	.1250E -01	.6219E -03	1.000	.2124	.0473	.5609E 03	.2113E 02	.1560E 02	.8677E 02	1.701	.4224E -06	.7475E -06	.4805	1.703	.5752E 03	.62.346
21.0	23641	.6202E -09	.3066E -07	.2931E -01	.1																	

Table I continued

$T_t = 10000^{\circ}\text{K}$ $P_t = 1000 \text{ atmospheres}$ $\rho_t = 20.01 \text{ atmospheres}$ $H_t = 252.68 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.364$ $S/R_t = 36.854$

M	U	P/P_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
1.0006	6763	.5670E 00	.6207E 00	.9315E 00	.3368E-00	.1000E 01	.9095E 00	.6781E 04	1.338													
2.0	12051	.1336E 00	.1829E 00	.7804E 00	.3152E 00	.1904E 01	.7126E 00	.3561E 04	1.277	.5363	.3085	.4263E 01	.3242E 01	.1226E 01	.1365E 01	1.370	.6739E 00	.6833E 00	.9766	1.378	.5046E 01	37.395
2.5	14062	.5338E-01	.8423E-01	.6960E 00	.1976E 00	.3545E 01	.6087E 01	.1913E 04	1.243	.4551	.2218	.6760E 01	.4508E 01	.1342E 01	.1611E 01	1.388	.4070E 00	.4203E 00	.9477	1.394	.7624E 01	38.095
3.0	15697	.1992E-01	.3678E-01	.6098E 00	.1079E 00	.7271E 01	.5124E 00	.9327E 03	1.212	.4004	.1736	.9919E 01	.5762E 01	.1482E 01	.1923E 01	1.408	.2171E 00	.2295E 00	.9132	1.413	.1089E 01	38.977
3.5	16974	.7349E-02	.1615E-01	.5231E 00	.5520E-01	.1531E 02	.4299E 00	.4428E 03	1.187	.3654	.1445	.1385E 02	.6619E 01	.1664E 01	.2299E 01	1.428	.1101E 00	.1195E 00	.8780	1.432	.1498E 02	39.943
4.0	17862	.3065E-02	.7943E-02	.4519E 00	.3006E-01	.2959E 02	.3686E 00	.2292E 03	1.165	.3434	.1274	.1812E 02	.7850E 01	.1862E 01	.2685E 01	1.444	.5949E-01	.6613E-01	.8476	1.448	.1941E 02	40.828
4.5	18526	.1383E-02	.4123E-02	.4009E 00	.1679E-01	.5496E 02	.3208E 00	.1234E 03	1.141	.3278	.1156	.2247E 02	.8652E 01	.2032E 01	.3088E 01	1.458	.3307E-01	.3764E-01	.8201	1.462	.2392E 02	41.682
5.0	19100	.6115E-03	.2071E-02	.3613E 00	.8964E-02	.1016E 03	.2781E 00	.6391E 02	1.115	.3135	.1058	.2721E 02	.9452E 01	.2179E 01	.3567E 01	1.473	.1762E-01	.2056E-01	.7919	1.476	.2881E 02	42.606
5.5	19623	.2576E-03	.9853E-03	.3280E 00	.4500E-02	.2171E 03	.2380E 00	.3123E 02	1.088	.3006	.1028	.3255E 02	.1028E 02	.2314E 01	.4171E 01	1.487	.8832E-02	.1060E-01	.7627	1.490	.3429E 02	43.629
6.0	20096	.1042E-03	.4487E-03	.2985E 00	.2150E-02	.4656E 03	.2008E 00	.1457E 01	1.061	.2891	.0897	.3856E 02	.1114E 02	.2446E 01	.4949E 01	1.502	.4215E-02	.5213E-02	.7333	1.505	.4045E 02	44.736
6.5	20520	.4105E-04	.1990E-03	.2712E 00	.9939E-03	.1028E 04	.1668E 00	.6595E 01	1.038	.2787	.0833	.4539E 02	.1291E 02	.2587E 01	.5962E 01	1.516	.1948E-02	.2484E 02	.7045	1.518	.4745E 02	45.902
7.0	20891	.1606E-04	.8805E-04	.2444E 00	.4558E-03	.2282E 04	.1364E 00	.2971E 01	1.018	.2694	.0777	.5353E 02	.1287E 01	.2762E 01	.7295E 01	1.529	.8931E-03	.1175E-02	.6772	1.531	.5561E 02	47.091
7.5	21216	.6193E-05	.3918E-04	.2145E 00	.2092E-03	.5051E 04	.1093E 00	.1343E 01	1.005	.2615	.0730	.6261E 02	.1371E 02	.3028E 01	.9106E 01	1.541	.4096E-03	.5557E-03	.6516	1.543	.6613E 02	48.289
8.0	21457	.2693E-05	.1992E-04	.1843E 00	.1088E-03	.9820E 04	.8899E-01	.6905E 00	1.001	.2554	.0695	.7617E 02	.1439E 02	.3416E 01	.1120E 02	1.550	.2129E-03	.2963E-03	.6314	1.553	.7904E 02	49.301
8.5	21605	.1481E-05	.1248E-04	.1619E 00	.6912E-04	.15575E 05	.7625E-01	.4356E 00	1.000	.2516	.0673	.8803E 02	.1486E 02	.3807E 01	.1306E 02	1.557	.1352E-03	.1915E-03	.6179	1.559	.9125E 02	50.008
9.0	21717	.8898E-06	.8437E-05	.1439E 00	.4720E-04	.2291E 05	.6672E-01	.2960E 00	1.000	.2486	.0656	.1001E 03	.1524E 02	.4207E 01	.1493E 02	1.562	.9224E-04	.1326E-03	.6070	1.564	.1037E 03	50.604
9.5	21802	.5736E-06	.6038E-05	.1296E 00	.3405E-04	.3189E 05	.5939E-01	.2126E 00	1.000	.2462	.0643	.1121E 03	.1555E 02	.4602E 01	.1677E 02	1.566	.6652E-04	.9682E-04	.5979	1.568	.1160E 03	51.116
10.0	21874	.3786E-06	.4407E-05	.1172E 00	.2501E 04	.4355E 05	.5312E 00	.1557E 00	1.000	.2441	.0631	.1248E 03	.1584E 02	.5017E 01	.1875E 02	1.570	.4886E-04	.7195E-04	.5895	1.572	.1291E 03	51.600
10.5	21937	.2553E-06	.3272E-05	.1065E 00	.1868E-04	.5848E 04	.4774E-01	.1160E 00	1.000	.2422	.0621	.1828E 03	.1611E 02	.5452E 01	.2087E 02	1.573	.3647E-04	.5429E-04	.5818	1.575	.1428E 03	52.060
11.0	21990	.1757E-06	.2471E-05	.9702E 01	.1417E 05	.7728E 05	.4309E-01	.8775E-01	1.000	.2404	.0611	.1524E 03	.1636E 02	.5909E 01	.2312E 02	1.577	.2766E-04	.4161E-04	.5746	1.578	.1575E 03	52.495
11.5	22036	.1230E-06	.1893E-05	.8870E 01	.1090E 04	.3905E-01	.6737E-01	1.000	.2389	.0603	.1675E 03	.1660E 02	.6390E 01	.2552E 02	1.580	.2128E-04	.3233E-04	.5680	1.581	.1730E 03	52.909	
12.0	22077	.8762E-07	.1470E 05	.8132E 01	.8499E-05	.1294E 06	.3552E 01	.5242E 01	1.000	.2374	.0595	.1834E 03	.1818E 02	.6894E 01	.2805E 02	1.582	.1659E-04	.2543E-04	.5618	1.584	.1893E 03	53.303
12.5	22112	.6354E-07	.1159E-05	.7481E 01	.6721E 05	.1363E 06	.3246E 01	.5132E 01	1.000	.2361	.0588	.2001E 03	.1702E 02	.7471E 01	.3071E 02	1.585	.1312E-04	.2028E 04	.5560	1.587	.2064E 03	53.676
13.0	22143	.4676E-07	.9245E-06	.6901E 01	.5377E-05	.2051E 06	.2976E 01	.3307E 01	1.000	.2349	.0581	.2175E 03	.1721E 02	.7964E 01	.3349E 02	1.587	.1049E-04	.1636E-04	.5507	1.589	.2244E 03	54.030
13.5	22170	.3497E-07	.7472E 06	.6387E 01	.4356E-06	.2534E 06	.2740E 01	.1000	.2337	.0575	.2358E 03	.1739E 02	.8528E 01	.3637E 02	1.590	.8502E-05	.1336E-04	.5457	1.591	.2431E 03	54.364	
14.0	22193	.2649E-07	.6100E 06	.5925E 01	.3101E 06	.2531E 01	.2187E 01	1.000	.2327	.0570	.2547E 03	.1756E 02	.9114E 01	.3998E 02	1.592	.6955E-05	.1101E 04	.5411	1.594	.2626E 03	54.684	
14.5	22214	.2034E-07	.5034E-06	.5512E 01	.2947E 05	.3754E 06	.2347E 01	.1806E 01	1.000	.2317	.0565	.2747E 03	.1771E 02	.9714E 01	.4248E 02	1.594	.5748E-05	.9160E-05	.5367	1.596	.2827E 03	54.988
15.0	22233	.1581E-07	.4195E-06	.5143E 01	.2460E 05	.4501E 06	.2183E 01	.1507E 01	1.000	.2308	.0560	.2947E 03	.1787E 02	.1034E 02	.4567E 02	1.596	.4801E-05	.7699E-05	.5326	1.597	.3036E 03	55.276
15.5	22250	.1243E-07	.3526E-06	.4811E 01	.2071E 05	.5351E 06	.2036E 01	.1267E 01	1.000	.2300	.0555	.3155E 03	.1800E 02	.1097E 02	.4895E 02	1.597	.4041E-05	.6520E-05	.5288	1.599	.3250E 03	55.551
16.0	22265	.9873E-08	.2978E-06	.4510E 01	.1756E 05	.6913E 06	.1905E 01	.1074E 01	1.000	.2292	.0551	.3370E 03	.1814E 02	.1162E 02	.5233E 02	1.599	.3427E 05	.5562E 05	.5252	1.601	.3471E 03	55.815
16.5	22278	.7912E 08	.2547E 06	.4238E 01	.1500E 05	.7398E 06	.1787E 01	.9166E 02	1.000	.2284	.0547	.3595E 03	.1827E 02	.1229E 02	.5580E 02	1.601	.2926E 05	.4776E 05	.5217	1.602	.3698E 03	56.068
17.0	22290	.6394E 08	.2186E 06	.3991E 01	.1288E 05	.8616E 06	.1680E 01	.7871E 02	1.000	.2277	.0544	.3820E 03	.1839E 02	.1297E 02	.5936E 02	1.602	.2515E 05	.4127E 05	.5185	1.604	.3953E 03	56.310
17.5	22301	.5209E 08	.1888E 06	.3765E 01	.1114E 05	.9974E 06	.1583E 01	.6799E 02	1.000	.2270	.0540	.4054E 03	.1851E 02	.1366E 02	.6301E 02	1.603	.2173E 05	.3585E 05	.5154	1.605	.4172E 03	56.545
18.0	22311	.4273E 08	.1639E 06	.3559E 01	.9672E 06	.1149E 07	.1494E 01	.5903E 02	1.000	.2263	.0537	.4293E 03	.1861E 02	.1437E 02	.6675E 02	1.605	.1888E 05	.3129E 05	.5124	1.606	.4418E 03	56.771
18.5	22320	.3526E 08	.1427E 06	.3370E 01	.8436E 06	.1318E 07	.1412E 01	.5147E 02	1.000	.2256	.0534	.4340E 03	.1873E 02	.1509E 02	.7060E 02	1.606	.1647E 05	.2743E 05	.5096	1.608	.4670E 03	56.990
19.0	22329	.2927E 08	.1250E 06	.3196E 01	.7390E 06	.1505E 07	.1338E 01	.4507E 02	1.000	.2251	.0531	.4791E 03	.1883E 02	.1583E 02	.7454E 02	1.607	.1442E 05	.2413E 05	.5069	1.609	.4928E 03	57.204
19.5	22337	.2443E 08	.1098E 06	.3035E 01	.6499E 06	.1712E 07	.1269E 01	.3962E 02	1.000	.2245	.0528	.5049E 03	.1893E 02	.1659E 02	.1269E 05	1.608	.2132E 05	.5042	1.610	.5193E 03	57.410	
20.0	22344	.2048E 08	.9903E 05	.2886E 01	.5735E 06	.1929E 07	.1205E 01	.3498E 02	1.000	.2239	.0526	.5314E 03	.1903E 02	.1735E 02	.8275E 02	1.609	.1119E 05	.1890E 05	.5017	1.611	.5446E 03	57.612
20.5	22351	.1723E 08	.8503E 05	.2749E 01	.5077E 06	.1929E 07	.1148E 01	.3498E 02	1.000	.2233	.0525	.5584E 03	.1912E 02	.1814E 02	.8701E 02	1.610	.9068E 05	.1679E 05	.4993	1.612	.5446E 03	57.839
21.0	22357	.1461E 08	.7605E 05	.2621E 01	.4509E 06	.2469E 07	.1091E 01	.2746E 02	1.000</													

Table I continued

$T_t = 10000^\circ\text{K}$ $P_t = 2000 \text{ atmospheres}$ $\rho_t = 42.17 \text{ atmospheres}$ $H_t = 229.04 \times 10^8 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.295$ $S/R_t = 35.168$

M	U	P/P_t	ρ/ρ_t	T/T_t	q/P_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/P_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/P_1	S/R_2
0.9995	6591	.5664E 00	.6216E 00	.9269E 00	.3375E 00	.1000E 01	.9052E 00	.1395E 05	1.273													
2.0	11743	.1317E 00	.1832E 00	.7615E 00	.3157E 00	.1905E 01	.6990E 00	.7322E 04	1.222	.5383	.3104	.4307E 01	.3222E 01	.1255E 01	.1389E 01	1.302	.6724E 00	.6807E 00	.9774	1.309	.5106E 01	35.685
2.5	13654	.5286E-01	.8572E-01	.6681E 00	.1998E 00	.3500E 01	.5930E 00	.3984E 04	1.195	.4973	.2256	.6850E 01	.4433E 01	.1400E 01	.1651E 01	1.320	.4097E 00	.4215E 00	.9500	1.325	.7749E 01	36.337
3.0	15161	.2024E-01	.3895E-01	.5744E 00	.1119E 01	.6937E 01	.4982E 00	.2010E 04	1.171	.4076	.1792	.1008E 02	.5580E 01	.1579E 01	.1975E 01	1.339	.2249E 00	.2361E 00	.9182	1.344	.1111E 02	37.138
3.5	16263	.8176E-02	.1866E-01	.4941E 00	.6169E-01	.1350E 02	.4226E 00	.1033E 04	1.148	.3761	.1524	.1379E 02	.6561E 01	.1778E 01	.2334E 01	1.357	.1225E 00	.1314E 00	.8872	1.361	.1498E 02	37.959
4.0	17074	.3559E-02	.9429E-02	.4349E 00	.3436E-01	.2545E 02	.3636E 00	.5480E 03	1.124	.3545	.1351	.1770E 02	.7400E 01	.1957E 01	.2718E 01	1.373	.6780E-01	.7429E-01	.8584	1.377	.1905E 02	38.768
4.5	17758	.1526E-02	.4644E-02	.3881E 00	.1831E 01	.4967E 00	.3116E 00	.2808E 03	1.098	.3362	.2121	.2204E 02	.8214E 01	.2121E 01	.3177E 01	1.389	.3599E-01	.4037E-01	.8289	1.393	.2355E 02	39.645
5.0	18360	.6334E-03	.2194E-02	.3487E 00	.9243E-02	.1017E 03	.2641E 00	.1371E 03	1.072	.3206	.1106	.2695E 02	.9038E 01	.2276E 01	.3752E 01	1.405	.1813E-01	.2087E 01	.7985	1.408	.2862E 02	40.604
5.5	18888	.2555E-03	.1005E-02	.3143E 00	.4481E-02	.2159E 03	.2212E 00	.6461E 02	1.048	.3071	.1014	.3251E 02	.9867E 01	.2431E 01	.4485E 01	1.420	.8775E-02	.1039E 01	.7681	1.423	.3434E 02	41.630
6.0	19351	.1012E-03	.4521E-03	.2822E 00	.2116E-02	.4683E 03	.1825E 00	.2978E 02	1.027	.2953	.0935	.3891E 02	.1069E 02	.2604E 01	.5453E 01	1.435	.4140E-02	.5049E-02	.7384	1.438	.4091E 02	42.704
6.5	19752	.3967E-04	.2031E-03	.2501E 00	.9905E-03	.1021E 04	.1366E 00	.1011	.2950	.0870	.4659E 02	.1150E 02	.2828E 01	.6701E 01	1.449	.1936E-02	.2433E-02	.7102	1.451	.4881E 02	43.801	
7.0	20085	.1590E-04	.9501E-04	.2161E 00	.4791E-03	.2147E 04	.1193E 00	.6496E 01	1.003	.2765	.0816	.5634E 02	.1225E 02	.3157E 01	.8333E 01	1.461	.9356E-03	.1209E-02	.6847	1.463	.5886E 02	44.860
7.5	20313	.7593E-05	.5265E-04	.1867E 00	.2176E 03	.3831E 05	.9919E-01	.3641E 01	1.000	.2706	.0780	.6695E 02	.1282E 02	.3554E 01	.1003E 02	1.470	.5299E-03	.7000E-03	.6657	1.472	.6979E 02	45.694
8.0	20470	.4197E-05	.3318E-04	.1638E 00	.1738E-03	.6032E 05	.8519E-01	.2312E 01	1.000	.2665	.0755	.7756E 02	.1325E 02	.3965E 01	.1168E 02	1.477	.3389E-03	.4555E-03	.6515	1.479	.8075E 02	46.353
8.5	20592	.2486E-05	.2218E-04	.1451E 00	.1176E 03	.8968E 04	.7428E-01	.1555E 01	1.000	.2631	.0735	.8863E 02	.1361E 02	.4392E 01	.1399E 02	1.482	.2292E-03	.3127E 03	.6393	1.485	.9220E 02	46.933
9.0	20687	.1569E-05	.1582E-04	.1300E 00	.8357E-04	.1268E 05	.6575E-01	.1100E 01	1.000	.2603	.0718	.9986E 02	.1392E 02	.4824E 01	.1514E 02	1.487	.1628E-03	.2250E-03	.6290	1.489	.1038E 03	47.441
9.5	20767	.1016E-05	.1124E-04	.1171E 00	.6057E-04	.1756E 05	.5851E-01	.7943E 00	1.000	.2578	.0704	.1118E 03	.1421E 02	.5278E 01	.1701E 02	1.491	.1180E-03	.1650E-03	.6196	1.494	.1116E 03	47.921
10.0	20835	.6733E-06	.8236E-05	.1059E 00	.4469E-06	.2388E 05	.5233E 01	.5841E 00	1.000	.2557	.0691	.1246E 03	.1474E 02	.5755E 01	.1902E 02	1.495	.8702E-04	.1232E 04	.6109	1.498	.1292E 03	48.376
10.5	20893	.4559E-06	.6145E-06	.9608E-01	.3353E-04	.3191E 06	.4703E-01	.4370E 00	1.000	.2536	.0679	.1381E 03	.1472E 02	.6258E 01	.2117E 02	1.499	.6528E-04	.9341E-04	.6029	1.501	.1432E 03	48.807
11.0	20943	.3146E-06	.4656E-05	.8749E-01	.2553E-04	.4201E 05	.3319E 01	.1000	.2518	.0669	.1524E 03	.1494E 02	.6788E 01	.2346E 02	1.503	.4956E-04	.7182E-04	.5954	1.505	.1579E 03	49.217	
11.5	20987	.2212E-06	.3584E-05	.7949E-01	.1973E-04	.5447E 05	.3847E-01	.2560E 00	1.000	.2501	.0660	.1675E 03	.1518E 02	.7344E 01	.2589E 02	1.506	.3840E-04	.5604E-04	.5885	1.508	.1736E 03	49.605
12.0	21024	.1586E-06	.2801E-05	.7329E-01	.1548E-04	.6956E 05	.3502E-01	.2005E 00	1.000	.2487	.0651	.1835E 02	.2483E 02	.7923E 01	.1535E 02	1.509	.3012E-04	.4436E-04	.5821	1.510	.1900E 03	49.971
12.5	21057	.1156E-06	.2219E-05	.6741E-01	.1230E 00	.8786E 05	.3020E 01	.1591E 01	1.000	.2473	.0644	.2002E 03	.1553E 02	.8527E 01	.3110E 02	1.511	.2394E-04	.3555E 04	.5762	1.513	.2072E 03	50.318
13.0	21085	.8558E-07	.1781E-05	.6220E-01	.9900E-01	.1091E 06	.2940E-01	.1279E 00	1.000	.2461	.0637	.2176E 02	.1570E 02	.9153E 01	.3388E 01	1.514	.1925E-04	.2884E-04	.5707	1.518	.2251E 03	50.647
13.5	21110	.6426E-07	.1446E-05	.5756E-01	.4077E 01	.1342E 05	.2709E 01	.1039E 01	1.000	.2449	.0630	.2398E 02	.1586E 02	.9804E 01	.3677E 02	1.518	.1567E-04	.2364E 03	.5656	1.518	.2438E 03	50.959
14.0	21132	.4900E-07	.1188E-05	.5343E-01	.6629E 05	.1632E 06	.2506E 01	.1000	.2439	.0624	.2546E 02	.1601E 02	.1047E 02	.3975E 02	1.518	.1290E-04	.1960E 02	.5608	1.520	.2632E 03	51.255	
14.5	21152	.3785E-07	.9852E-06	.4975E-01	.5510E-05	.1966E 06	.2326E 01	.7094E-01	1.000	.2428	.0619	.2747E 03	.1616E 02	.4283E 02	.1116E 02	1.520	.1072E-04	.1604E-04	.5563	1.522	.2835E 03	51.536
15.0	21169	.2957E-06	.8246E-05	.4644E-01	.4619E-05	.1966E 06	.2326E 01	.5942E-01	1.000	.2418	.0614	.2942E 03	.1629E 02	.4286E 02	.1116E 02	1.522	.8990E-05	.1384E-04	.5521	1.524	.3040E 03	51.804
15.5	21183	.2335E-07	.6956E-06	.4346E-01	.3902E-05	.2780E 06	.2023E 01	.5017E 01	1.000	.2410	.0609	.3149E 03	.1642E 02	.4286E 02	.1126E 02	1.524	.1092E-05	.1176E 04	.5481	1.526	.3252E 03	52.062
16.0	21199	.1861E-07	.5911E-06	.4077E 01	.3320E-05	.3270E 06	.1894E 01	.2666E-01	1.000	.2401	.0605	.3362E 03	.1654E 02	.4266E 02	.1132E 02	1.525	.6460E-05	.1006E-04	.5443	1.527	.3472E 03	52.308
16.5	21211	.1497E-07	.5056E-07	.3833E-01	.2844E-05	.3838E 06	.1778E-01	.1000	.2394	.0600	.3580E 02	.1665E 02	.1404E 02	.4240E 02	1.527	.5593E-05	.8666E-05	.5408	1.529	.3869E 03	52.545	
17.0	21223	.1213E-06	.4351E-06	.3611E 01	.2449E-05	.4437E 06	.1673E-01	.3143E-01	1.000	.2386	.0596	.3808E 03	.1677E 02	.1485E 02	.5059E 02	1.529	.4776E-05	.5707E-05	.5374	1.530	.3929E 03	52.773
17.5	21233	.9904E-08	.3762E-06	.3409E 01	.2120E-05	.5128E 06	.1577E-01	.2179E 01	1.000	.2380	.0593	.4037E 03	.1687E 02	.1564E 02	.6321E 02	1.530	.4126E-05	.6531E-05	.5341	1.532	.4166E 03	52.994
18.0	21242	.8137E-08	.3269E-06	.3223E 01	.1844E-05	.5900E 06	.1485E-01	.2364E 01	1.000	.2373	.0589	.4275E 03	.1698E 02	.1644E 02	.6659E 02	1.531	.3398E-05	.5709E-05	.5310	1.533	.4411E 03	53.207
18.5	21251	.6725E-08	.2829E-06	.3053E 01	.1610E-05	.6759E 06	.1408E-01	.2054E 01	1.000	.2366	.0586	.4518E 03	.1708E 02	.1726E 02	.7078E 02	1.533	.3135E-05	.5201E-05	.5280	1.534	.4616E 03	53.415
19.0	21259	.5588E-08	.2499E-06	.2895E 01	.1412E-05	.7711E 06	.1334E-01	.1809E 01	1.000	.2360	.0582	.4767E 03	.1717E 02	.1810E 02	.7473E 02	1.534	.2748E-05	.4412E-05	.5251	1.536	.4917E 03	53.617
19.5	21267	.4647E-06	.2160E-06	.2750E-01	.1242E-05	.8766E 06	.1248E-01	.1591E 01	1.000	.2355	.0579	.5023E 02	.1726E 02	.1896E 02	.8768E 02	1.535	.2410E-05	.3900E-05	.5224	1.537	.5180E 03	53.814
20.0	21273	.3919E-08	.1939E-06	.2616E-01	.1077E-05	.9920E 06	.6120E-01	.1404E 01	1.000	.2348	.0576	.5286E 03	.1735E 02	.1983E 02	.8293E 02	1.536	.2136E-05	.3460E-05	.5197	1.538	.5451E 03	54.004
20.5	21280	.3026E-08	.1716E-06	.2491E-01	.9714E-05	.7374E 06	.6122E 01	.1143E 01	1.000	.2343	.0574	.5394E 03	.1744E 02	.2072E 02	.8712E 02	1.538	.1891E-05	.3077E-05	.5171	1.539	.5728E 03	54.192
21.0	21286	.2799E-08	.1522E-06	.2375E-01	.8624E-06	.7015E 07	.1086E-01	.110														

Table I continued

$T_t = 10000^\circ\text{K}$ $p_t = 3000 \text{ atmospheres}$ $\rho_t = 65.03 \text{ atmospheres}$ $H_t = 217.70 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.259$ $S/R_t = 34.283$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	p_2/p_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	ρ_2/ρ_t	p_{t2}/p_t	T_{t2}/T_t	Z_{t2}	p_{t2}/p_1	S/R_2
0.9990	6507	.5655E 00	.6217E 00	.9237E 00	.3383E-00	1.000E 01	.9027E 00	.2124E 05	1.240													
2.0	11570	.1311E 00	.1842E 00	.7500E 00	.3169E 00	.1898E 01	.6925E 00	.1119E 05	1.195	5403	3124	.4323E 01	.3201E 01	.1274E 01	.1401E 01	1.267	.6733E 00	.6807E 00	.9782	1.273	.5134E 01	34.784
2.5	13429	.5277E-01	.8698E-01	.6521E 00	.2016E 00	.3463E 01	.5858E 00	.6132E 04	1.172	4606	2283	.6895E 01	.4380E 01	.1436E 01	.1670E 01	1.285	.4124E 00	.4231E 00	.9517	1.290	.7816E 01	35.413
3.0	14849	.2084E-01	.4082E-01	.5596E 00	.1157E 00	.6674E 01	.4936E 00	.3182E 04	1.149	4125	1834	.1006E 02	.5453E 01	.1526E 01	.1991E 01	1.304	.2319E 00	.2422E 00	.9217	1.308	.1113E 02	36.161
3.5	15888	.8709E-02	.2008E-01	.4852E 00	.6513E-01	.1268E 02	.4202E 00	.1675E 04	1.126	3816	1570	.1361E 02	.6370E 01	.1820E 01	.2346E 01	1.321	.1292E 00	.1375E 00	.8924	1.325	.1483E 02	36.931
4.0	16705	.3723E-02	.9950E-02	.4279E 00	.3568E-01	.2434E 02	.3590E 00	.8726E 03	1.101	3590	1388	.1751E 02	.7206E 01	.1999E 01	.2751E 01	1.338	.7032E 01	.7646E-01	.8631	1.342	.1889E 02	37.741
4.5	17400	.1555E-02	.4775E-02	.3812E 00	.1858E-01	.4869E 02	.3046E 00	.4362E 03	1.076	3402	1246	.2192E 02	.8025E 01	.2169E 01	.3248E 01	1.355	.3647E-01	.4060E-01	.8329	1.358	.2345E 02	38.627
5.0	18005	.6302E-03	.2213E-02	.3410E 00	.9218E-02	.1015E 03	.2554E 00	.2091E 03	1.052	3240	1131	.2694E 02	.8844E 01	.2336E 01	.3878E 01	1.372	.1806E-01	.2062E-01	.8021	1.375	.2855E 02	39.587
5.5	18525	.2527E-03	.1011E-02	.3052E 00	.4461E-02	.2119E 03	.2118E 00	.9837E 02	1.031	3105	1036	.3265E 02	.9649E 01	.2514E 01	.4682E 01	1.387	.8726E-02	.1024E-01	.7718	1.390	.3453E 02	40.591
6.0	18977	.9955E-04	.4570E-03	.2705E 00	.2115E-02	.4665E 00	.1729E 00	.4553E 02	1.014	2988	0958	.3942E 02	.1044E 02	.2731E 01	.5741E 01	1.402	.4132E-02	.4990E-02	.7424	1.405	.4151E 02	41.634
6.5	19354	.3971E-04	.2120E-03	.2350E 00	.1020E-02	.9861E 03	.1396E 00	.2154E 02	1.004	2890	0894	.4778E 02	.1119E 02	.3030E 01	.7114E 01	1.415	.1991E 02	.2473E-02	.7153	1.418	.5014E 02	42.664
7.0	19634	.1776E-04	.1106E-03	.2020E 00	.5481E-03	.1862E 04	.1144E 00	.1140E 02	1.001	2817	.0847	.5749E 02	.1180E 02	.3419E 01	.8671E 01	1.426	.1069E-02	.1559E 02	.6934	1.428	.6017E 02	43.549
7.5	19826	.9283E-05	.6649E-04	.1758E 00	.3358E-03	.3069E 04	.9720E-01	.6920E 01	1.000	2767	.0815	.6746E 02	.1272E 02	.3835E 01	.1023E 02	1.434	.6541E-03	.8476E-03	.6768	1.436	.7047E 02	44.252
8.0	19967	.5353E-05	.4345E-04	.1552E 00	.2226E-03	.4663E 04	.8428E-01	.4554E 01	1.000	2728	.0791	.7758E 02	.1265E 02	.4259E 01	.1180E 02	1.440	.4333E-03	.5703E 03	.6634	1.442	.8094E 02	44.844
8.5	20084	.3191E-05	.2925E-04	.1374E 00	.1516E-03	.6868E 04	.7354E-01	.3084E 01	1.000	2695	.0770	.8817E 02	.1299E 02	.4725E 01	.1352E 02	1.446	.2950E-03	.3940E-03	.6513	1.448	.9246E 02	45.399
9.0	20173	.2042E-05	.2083E-04	.1234E 00	.1090E-03	.9626E 04	.6530E-01	.2206E 01	1.000	2666	.0753	.9967E 02	.1327E 02	.5176E 01	.1523E 02	1.451	.2119E-03	.2666E-03	.6411	1.453	.1038E 03	45.879
9.5	20251	.1322E-05	.1499E-04	.1111E 00	.7901E-04	.1333E 05	.5070E-01	.1594E 01	1.000	2641	.0738	.1117E 03	.1354E 02	.5666E 01	.1713E 02	1.455	.1536E-03	.2102E-03	.6314	1.457	.1162E 03	46.347
10.0	20317	.8778E-06	.1101E-04	.1004E 00	.5842E-04	.1808E 05	.5193E-01	.1175E 01	1.000	2619	.0725	.1244E 03	.1379E 02	.6183E 01	.1916E 02	1.459	.1116E-03	.1572E-03	.6226	1.461	.1294E 03	46.787
10.5	20373	.5958E-06	.8283E-05	.9109E-01	.4394E-04	.2411E 05	.4666E-01	.8810E 00	1.000	2599	.0713	.1379E 03	.1402E 02	.6725E 01	.2133E 02	1.463	.8539E-04	.1195E 03	.6144	1.465	.1433E 03	47.204
11.0	20422	.4117E-06	.6254E-05	.8290E-01	.3352E-04	.3167E 05	.4210E-01	.6705E 00	1.000	2580	.0702	.1524E 03	.1424E 02	.7298E 01	.2364E 02	1.466	.6515E-04	.9209E-04	.6068	1.468	.1582E 03	47.601
11.5	20463	.2907E-06	.4832E-05	.7576E-01	.2600E 04	.4091E 05	.3819E-01	.1000	2564	.0693	.1675E 02	.1343E 02	.7895E 01	.2606E 02	1.469	.5052E-04	.7209E-04	.5998	1.472	.1738E 03	47.975	
12.0	20500	.2087E-06	.3785E-05	.6944E-01	.2044E-04	.5213E 05	.3478E-01	.4074E 00	1.000	2548	.0684	.1835E 03	.1462E 02	.8521E 01	.2862E 02	1.472	.3972E-04	.5719E-04	.5933	1.474	.1903E 03	48.328
12.5	20531	.1527E-06	.3010E-05	.6389E 00	.1630E-04	.5547E 05	.3182E-01	.3244E 00	1.000	2534	.0676	.2001E 03	.1480E 02	.9169E 01	.3129E 02	1.475	.3168E 04	.4599E-04	.5873	1.477	.2075E 03	48.662
13.0	20558	.1133E-06	.2421E-05	.5894E-01	.1315E-04	.8127E 05	.2922E-01	.2619E 00	1.000	2522	.0669	.2176E 03	.1496E 02	.9848E 01	.3407E 02	1.478	.2555E-04	.3738E 04	.5817	1.480	.2254E 03	48.980
13.5	20583	.8543E-07	.1972E-05	.5456E-01	.1074E-04	.9968E 05	.2695E-01	.2131E 00	1.000	2510	.0662	.2357E 03	.1511E 02	.1054E 02	.3695E 02	1.480	.2086E-04	.3075E-04	.5765	1.482	.2441E 03	49.280
14.0	20604	.6533E-07	.1624E-05	.5067E-01	.8859E-05	.1209E 05	.2495E-01	.1756E 00	1.000	2500	.0656	.2545E 03	.1525E 02	.1212E 02	.3939E 02	1.482	.2555E-04	.5717	1.484	.2634E 03	49.565	
14.5	20622	.5059E-07	.1350E-05	.4719E-01	.7379E-05	.1453E 06	.2317E-01	.1462E 00	1.000	2489	.0650	.2737E 03	.1538E 02	.1199E 02	.4298E 02	1.484	.1433E 04	.2142E-04	.5671	1.486	.2834E 03	49.836
15.0	20639	.3961E-07	.1132E-05	.4406E-01	.6198E-05	.1731E 06	.2159E-01	.1227E 00	1.000	2479	.0645	.2927E 03	.1551E 02	.1374E 02	.4613E 02	1.486	.1204E-04	.2031E-04	.5623	1.488	.3040E 03	50.093
15.5	20654	.3133E-07	.9567E-05	.4125E-01	.5245E-05	.2047E 06	.2017E-01	.1037E 00	1.000	2470	.0640	.3143E 03	.1563E 02	.1498E 02	.4998E 02	1.488	.1019E-04	.1542E-04	.5588	1.490	.3252E 03	50.344
16.0	20668	.2502E-07	.8142E-06	.3871E-01	.4470E-05	.2404E 06	.1888E-01	.8838E-01	1.000	2462	.0635	.3353E 03	.1573E 02	.1430E 02	.5271E 02	1.490	.8686E-03	.1322E-04	.5549	1.491	.3471E 03	50.582
16.5	20680	.2016E-07	.6975E-06	.3640E-01	.3838E-05	.2805E 06	.1774E-01	.1774E-01	1.000	2455	.0631	.3572E 03	.1585E 02	.1511E 02	.5614E 02	1.491	.7470E-05	.1319E-05	.5513	1.493	.3694E 03	50.811
17.0	20691	.1636E-07	.6005E-06	.3430E-01	.3304E-05	.3256E 06	.16669E-01	.6523E-01	1.000	2447	.0627	.3795E 03	.1596E 02	.1503E 02	.5967E 02	1.493	.6419E-05	.9874E-05	.5478	1.495	.2834E 03	49.836
17.5	20701	.1336E-07	.5197E-06	.3238E-01	.2862E-05	.3761E 06	.1574E-01	.5647E-01	1.000	2440	.0623	.4026E 03	.1606E 02	.1678E 02	.6130E 02	1.494	.5561E-05	.8589E-05	.5445	1.496	.4162E 03	51.247
18.0	20710	.1099E-07	.4518E-06	.3062E-01	.2490E-05	.4323E 06	.1466E-01	.4912E 01	1.000	2433	.0619	.4262E 03	.1615E 02	.1744E 02	.6703E 02	1.494	.4840E-05	.7521E-05	.5413	1.497	.4405E 03	51.445
18.5	20718	.9084E-08	.3944E-06	.2901E-01	.2176E-05	.4950E 06	.1406E-01	.4290E-01	1.000	2426	.0615	.4505E 03	.1625E 02	.1852E 02	.7087E 02	1.497	.4229E-05	.6620E-05	.5382	1.499	.4855E 03	51.687
19.0	20726	.7572E-08	.3457E-06	.2752E-01	.1908E-05	.3647E 06	.1332E 01	.3761E 02	1.000	2420	.0612	.4753E 03	.1634E 02	.1941E 02	.7481E 02	1.498	.3708E-05	.5817E-05	.5353	1.500	.4910E 03	51.854
19.5	20733	.6311E-08	.3041E-06	.2614E-01	.1680E-05	.6417E 06	.1263E-01	.3310E-01	1.000	2413	.0608	.5009E 03	.1643E 02	.2033E 02	.7886E 02	1.500	.3265E-05	.5144E-05	.5324	1.501	.5174E 03	52.045
20.0	20740	.5296E-08	.2683E-06	.2486E-01	.1483E-05	.7271E 06	.12020E-01	.2921E-01	1.000	2408	.0605	.5270E 03	.1652E 02	.2126E 02	.8303E 02	1.501	.2982E-05	.4561E-05	.5297	1.502	.5443E 03	52.233
20.5	20746	.4462E-08	.2374E-06	.2367E-01	.1313E-05	.8215E 06	.1141E-01	.2589E 01	1.000	2402	.0602	.5539E 03	.1660E 02	.2222E 02	.8739E 02	1.502	.2552E-05	.4057E-05	.5270	1.504	.5721E 03	52.415
21.0	20752	.3776E-08	.2107E-06	.2257E-01	.1166E-05	.9252E 06	.1086E-01	.2														

Table I continued

$T_t = 10000^{\circ}\text{K}$ $P_t = 4000 \text{ atmospheres}$ $\rho_t = 88.32 \text{ atmospheres}$ $H_t = 210.60 \times 10^6 \text{ ft}^2/\text{sec}^2$ $Z_t = 1.236$ $S/R_t = 33.694$

M	U	p/p_t	ρ/ρ_t	T/T_t	q/p_t	A/A*	H/H_t	ρU	Z	M_2	U_2/U_1	P_2/P_1	ρ_2/ρ_1	T_2/T_1	H_2/H_1	Z_2	P_{t2}/p_t	ρ_{t2}/ρ_t	T_{t2}/T_t	Z_{t2}	P_{t2}/p_1	S/R_2
0.9990	6452	.5648E 00	.6218E 00	.9214E 00	.3389E 00	.1000E 01	.9011E 00	.2861E 05	1.219													
2.0	11445	.1313E 00	.1856E 00	.7424E 00	.3183E 00	.1889E 01	.6890E 00	.1515E 05	1.178	.5425	.3144	.4324E 01	.3181E 01	.1287E 01	.1407E 01	1.245	.6753E 00	.6822E 00	.9788	1.250	.5144E 01	34.183
2.5	13271	.5294E-01	.8818E-01	.6422E-00	.2038E-00	.5818E-01	.8344E-04	.1156	.4629	.2306	.6909E-01	.4337E-01	.1459E-01	.1680E-01	1.262	.4153E-00	.4252E-00	.9531	1.267	.7844E-01	34.795	
3.0	14460	.2131E-01	.4211E-01	.5516E-00	.1182E-00	.6508E-01	.4941E-04	.1234	.4159	.1863	.1002E-02	.5368E-01	.1653E-01	.2000E-01	1.281	.2356E-00	.2464E-00	.9243	1.285	.1111E-01	35.513	
3.5	15663	.8939E-02	.2074E-01	.4796E-00	.6662E-01	.1235E-02	.4175E-00	.2317E-04	1.111	.3849	.1596	.1353E-02	.6266E-01	.1846E-01	.2360E-01	1.299	.1320E-00	.1399E-00	.8954	1.302	.1476E-02	36.268
4.0	16480	.3789E-02	.1019E-01	.4233E-00	.3622E-01	.2390E-02	.3552E-00	.1197E-04	1.087	.3619	.1410	.1742E-02	.7094E-01	.2027E-01	.2779E-01	1.316	.7129E-01	.7713E-01	.8661	1.320	.1881E-02	37.074
4.5	17178	.1559E-02	.4823E-02	.3762E-00	.1863E-01	.4842E-02	.2993E-00	.5909E-03	1.052	.3426	.1264	.2188E-02	.7911E-01	.2203E-01	.3303E-01	1.333	.3655E-01	.4046E-01	.8356	1.337	.2344E-02	37.961
5.0	17778	.6292E-03	.2229E-02	.3355E-00	.9223E-02	.1012E-03	.2496E-00	.2826E-03	1.040	.3265	.1148	.2695E-02	.8713E-01	.2383E-01	.3966E-01	1.350	.1805E-01	.2049E-01	.8049	1.353	.2869E-02	38.909
5.5	18292	.2506E-03	.1017E-02	.2981E-00	.4456E-02	.2156E-03	.2055E-00	.1327E-03	1.022	.3120	.1053	.3281E-02	.9501E-01	.2583E-01	.4822E-01	1.366	.8707E-02	.1015E-01	.7747	1.369	.3474E-02	39.900
6.0	18755	.9826E-04	.4616E-03	.2616E-00	.2121E-02	.4639E-03	.1666E-02	.3012	.0974	.3996E-02	.1027E-02	.2842E-01	.5956E-01	.14381	.4139E-02	.4962E-02	.7456	1.383	.4213E-02	40.922		
6.5	19083	.4109E-04	.2254E-03	.2250E-00	.1074E-02	.9329E-03	.1353E-02	.0002	.2922	.0913	.4851E-02	.1095E-02	.3187E-01	.7335E-01	.1393	.2094E-02	.2575E-02	.7203	1.396	.5097E-02	41.868	
7.0	19331	.1974E-04	.1257E-03	.1941E-00	.6148E-03	.1615E-04	.1128E-00	.2857	.0871	.5786E-02	.1148E-02	.3593E-01	.8807E-01	1.403	.1197E-02	.1503E-02	.7005	1.405	.6064E-02	42.651		
7.5	19509	.1065E-04	.7769E-04	.1695E-00	.3871E-03	.2647E-04	.9635E-01	.1081E-01	1.000	.2809	.0840	.6756E-02	.1191E-02	.4023E-01	.1303E-01	1.411	.7529E-03	.9622E-03	.6847	1.413	.7068E-02	43.304
8.0	19646	.6175E-05	.5104E-04	.1496E-00	.2579E-03	.4001E-04	.8385E-01	.7150E-01	1.000	.2770	.0815	.7770E-02	.1227E-02	.4471E-01	.1189E-01	1.417	.5013E-03	.6505E-03	.6713	1.419	.8181E-02	43.880
8.5	19756	.3754E-05	.3492E-04	.1329E-00	.1784E-03	.5815E-04	.7328E-01	.4920E-01	1.000	.2738	.0795	.8849E-02	.1258E-02	.4949E-01	.1357E-02	1.423	.3467E-03	.4562E-03	.6595	1.425	.9236E-02	44.404
9.0	19845	.2390E-05	.2479E-04	.1192E-00	.1278E-03	.6156E-04	.6494E-01	.3508E-01	1.000	.2710	.0778	.9959E-02	.1286E-02	.5426E-01	.1531E-02	1.427	.2482E-03	.3307E-03	.6491	1.430	.1038E-03	44.881
9.5	19921	.1553E-05	.1789E-04	.1073E-00	.9295E-04	.1126E-05	.5778E-01	.2541E-02	1.000	.2684	.0762	.1116E-02	.3131E-02	.5939E-01	.1721E-02	1.432	.1805E-03	.2433E-03	.6394	1.439	.1162E-03	45.337
10.0	19985	.1033E-05	.1317E-04	.9697E-00	.6884E-04	.1522E-05	.5167E-01	.1876E-01	1.000	.2661	.0749	.1243E-02	.3336E-02	.6481E-01	.1925E-02	1.436	.1337E-03	.1822E-03	.6305	1.438	.1294E-03	45.768
10.5	20041	.7011E-06	.5856E-05	.8795E-01	.5182E-04	.2031E-05	.4642E-01	.1408E-01	1.000	.2640	.0736	.1379E-02	.3358E-02	.7053E-01	.2143E-02	1.440	.1006E-03	.1387E-03	.6222	1.442	.1435E-03	46.176
11.0	20088	.4857E-06	.5702E-05	.8005E-01	.3963E-04	.2662E-05	.4190E-01	.1075E-01	1.000	.2622	.0725	.1523E-02	.3379E-02	.7654E-01	.2375E-02	1.443	.7693E-04	.1071E-03	.6146	1.445	.1584E-03	46.564
11.5	20129	.3434E-06	.5605E-05	.7314E-01	.3079E-04	.3843E-05	.3801E-01	.8332E-01	1.000	.2606	.0715	.1674E-02	.3398E-02	.8281E-01	.2618E-02	1.447	.5976E-04	.8395E-04	.6075	1.449	.1740E-03	46.929
12.0	20164	.2472E-06	.4559E-05	.6705E-01	.2426E-04	.4365E-05	.3463E-01	.6554E-00	1.000	.2590	.0706	.1834E-03	.3141E-02	.8937E-01	.2874E-02	1.450	.4709E-04	.6675E-04	.6010	1.452	.1905E-03	47.274
12.5	20195	.1811E-06	.3630E-05	.6168E-01	.1938E-05	.4743E-05	.3169E-01	.5227E-00	1.000	.2576	.0698	.2001E-03	.4142E-02	.9618E-01	.3142E-02	1.452	.3716E-04	.5375E-04	.5949	1.454	.2077E-03	47.601
13.0	20222	.1347E-06	.2926E-05	.5692E-01	.1566E-04	.6781E-05	.2912E-01	.4219E-00	1.000	.2563	.0691	.2175E-03	.3448E-02	.1032E-02	.3418E-02	1.455	.3041E-04	.4379E-04	.5893	1.457	.2257E-03	47.910
13.5	20245	.1018E-06	.2388E-05	.5270E-01	.1281E-04	.8300E-05	.2687E-01	.3447E-00	1.000	.2552	.0684	.2354E-03	.4462E-02	.1105E-02	.3705E-02	1.457	.2486E-04	.3607E-04	.5840	1.459	.2424E-03	48.203
14.0	20266	.7798E-07	.1970E-05	.4849E-01	.1059E-04	.10505E-06	.2488E-01	.2540E	0.000	.2540	.0677	.2846E-02	.1476E-02	.4001E-02	.1459	.2056E-04	.3003E-04	.5791	1.461	.2636E-03	48.480	
14.5	20284	.6048E-07	.1640E-05	.4560E-01	.8832E-05	.1206E-06	.2312E-01	.2372E-00	1.000	.2531	.0672	.2734E-03	.1489E-02	.1257E-02	.4307E-02	1.461	.1714E-04	.2521E-04	.5745	1.463	.2835E-03	48.746
15.0	20300	.4742E-07	.1377E-05	.4259E-01	.7427E-05	.1436E-06	.2155E-01	.1993E-00	1.000	.2521	.0666	.2933E-03	.1501E-02	.1336E-02	.4621E-02	1.463	.1941E-04	.2133E-04	.5702	1.465	.3040E-03	48.999
15.5	20315	.3756E-07	.1165E-05	.3987E-01	.6292E-05	.1696E-06	.2014E-01	.1687E-00	1.000	.2511	.0661	.3139E-03	.1513E-02	.1416E-02	.4945E-02	1.465	.1221E-04	.1818E-04	.5661	1.467	.3252E-03	49.242
16.0	20328	.3003E-07	.9922E-06	.3742E-01	.5367E-05	.1989E-06	.1887E-01	.1438E-00	1.000	.2503	.0656	.3349E-03	.1523E-02	.1499E-02	.5277E-02	1.467	.1042E-04	.1560E-04	.5622	1.469	.3496E-03	49.476
16.5	20340	.2421E-07	.8503E-06	.3520E-01	.4605E-05	.2320E-06	.1772E-01	.1233E-00	1.000	.2494	.0652	.3567E-03	.1534E-02	.1469E-02	.5620E-02	1.469	.8941E-05	.1346E-05	.5585	1.470	.3694E-03	49.700
17.0	20351	.1965E-07	.7324E-06	.3317E-01	.3971E-05	.2692E-06	.1667E-01	.1063E-00	1.000	.2488	.0648	.3788E-03	.1544E-02	.1669E-02	.5972E-02	1.470	.7708E-05	.1167E-04	.5550	1.472	.3923E-03	49.918
17.5	20361	.1606E-07	.6342E-06	.3132E-01	.3441E-05	.2307E-06	.1572E-01	.9206E-01	1.000	.2480	.0643	.4019E-03	.1554E-02	.1757E-02	.6335E-02	1.472	.6683E-05	.1017E-04	.5516	1.473	.4160E-03	50.128
18.0	20370	.1321E-07	.5515E-06	.2962E-01	.2996E-05	.3571E-06	.1485E-01	.8010E-01	1.000	.2473	.0640	.4254E-03	.1564E-02	.1847E-02	.6708E-02	1.473	.5816E-05	.8891E-05	.5483	1.475	.4402E-03	50.333
18.5	20378	.1093E-07	.4815E-06	.2806E-01	.2618E-05	.4089E-06	.1404E-01	.6997E-01	1.000	.2467	.0636	.4495E-03	.1572E-02	.1939E-02	.7091E-02	1.474	.5802E-05	.7807E-05	.5452	1.476	.4651E-03	50.532
19.0	20386	.9088E-08	.4221E-06	.2662E-01	.2296E-05	.4666E-06	.1331E-01	.6136E-01	1.000	.2460	.0632	.4762E-03	.1581E-02	.2032E-02	.7486E-02	1.476	.4456E-05	.6880E-05	.5422	1.477	.4906E-03	50.725
19.5	20393	.7593E-08	.3713E-06	.2529E-01	.2021E-05	.5299E-06	.1262E-01	.5399E-01	1.000	.2454	.0629	.4997E-03	.1590E-02	.2128E-02	.7891E-02	1.477	.3924E-05	.6083E-05	.5593	1.479	.5168E-03	50.914
20.0	20399	.6370E-08	.3275E-06	.2405E-01	.1784E-05	.6005E-06	.1199E-01	.4764E-01	1.000	.2447	.0626	.5259E-03	.1598E-02	.2236E-02	.8310E-02	1.478	.3646E-05	.5395E-05	.5565	1.480	.5439E-03	51.098
20.5	20405	.5369E-08	.2899E-06	.2290E-01	.1580E-05	.6784E-06	.1140E-01	.2441	1.000	.2441	.0622	.5529E-03	.1607E-02	.2326E-02	.8740E-02	1.479	.3069E-05	.4795E-05	.5538	1.481	.5716E-03	51.278
21.0	20411	.4545E-08	.2574E-06	.2183E-01	.1404E-05	.7638E-06	.1060E-01	.3745E-01	1.000	.2436	.0619	.5803E-03	.1									

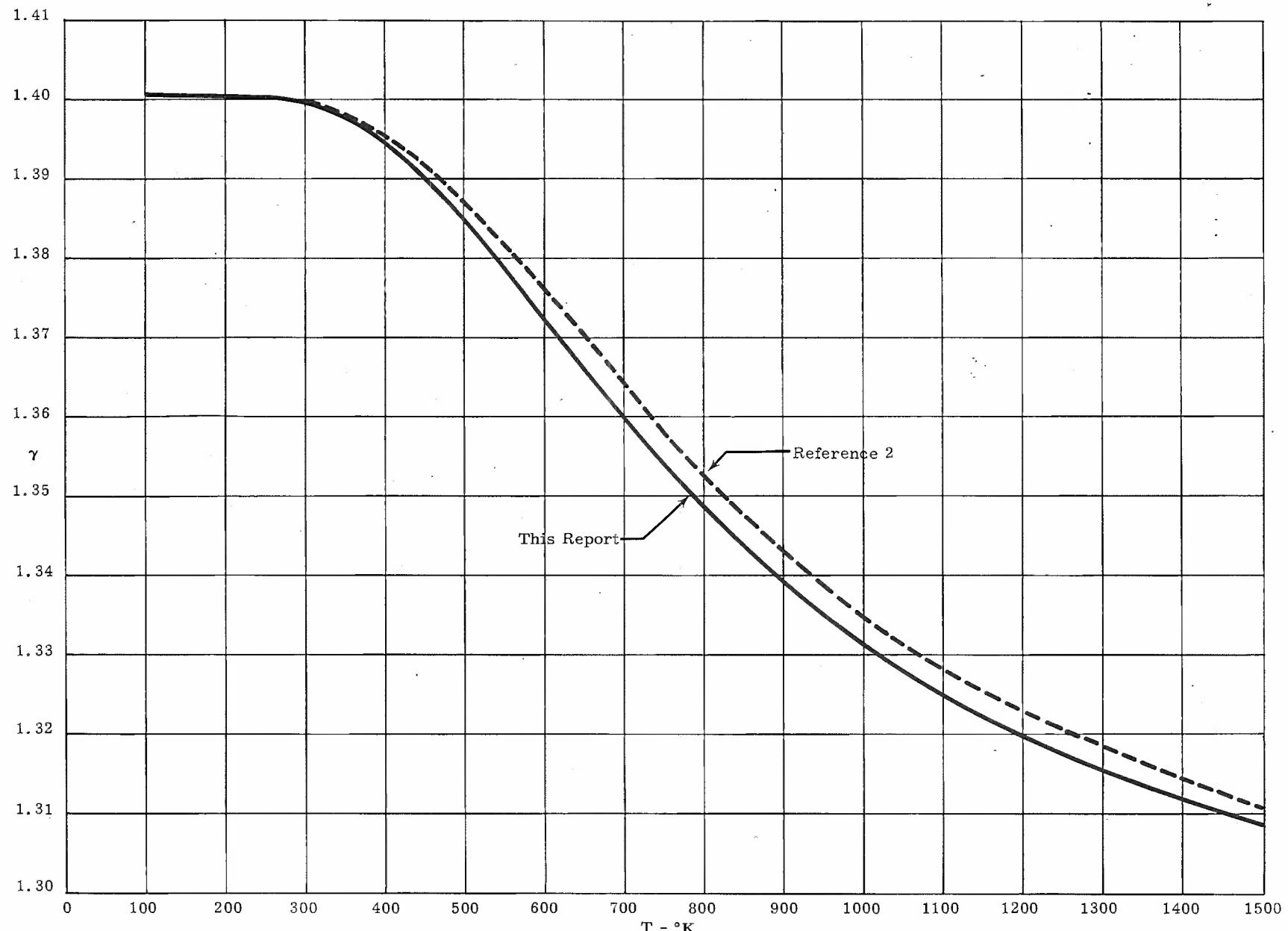


Fig. 1 -- Comparison of low temperature specific heat ratios used in this report with those of Reference 2

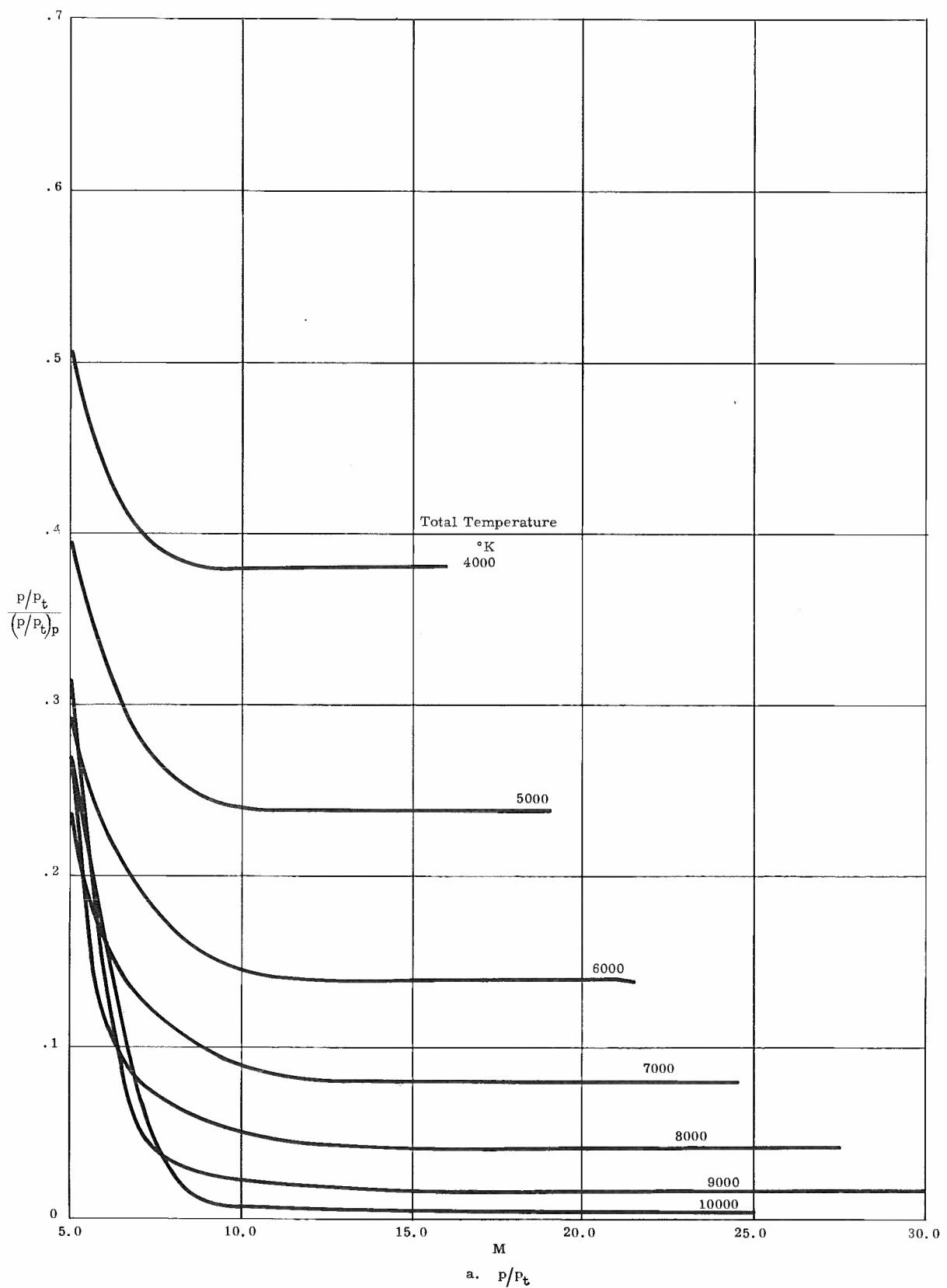


Fig. 2 -- Illustrative variation of ratios of real to perfect gas flow parameters with Mach number and total temperature at a total pressure of 500 atmospheres

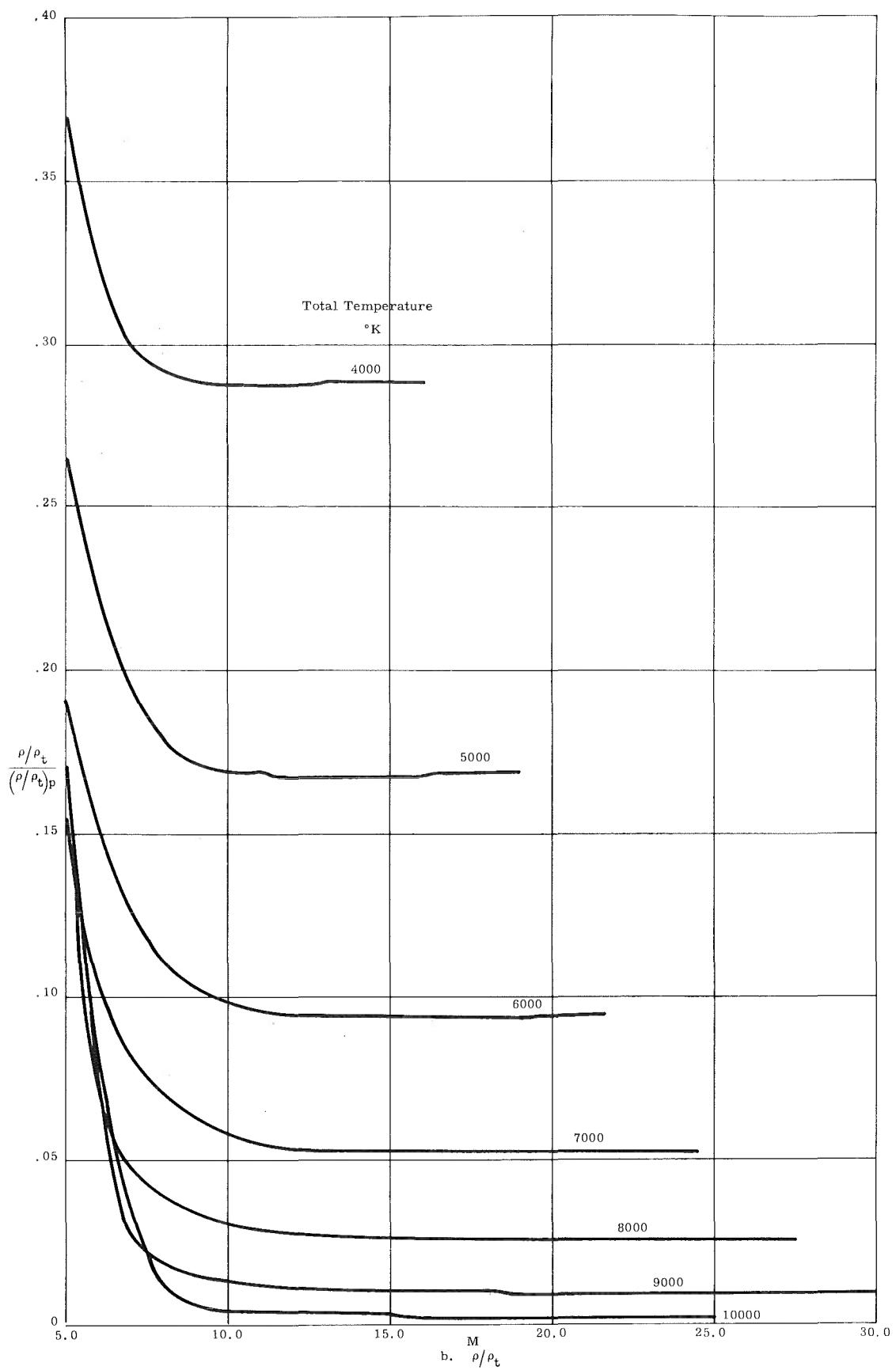


Fig. 2 -- Continued

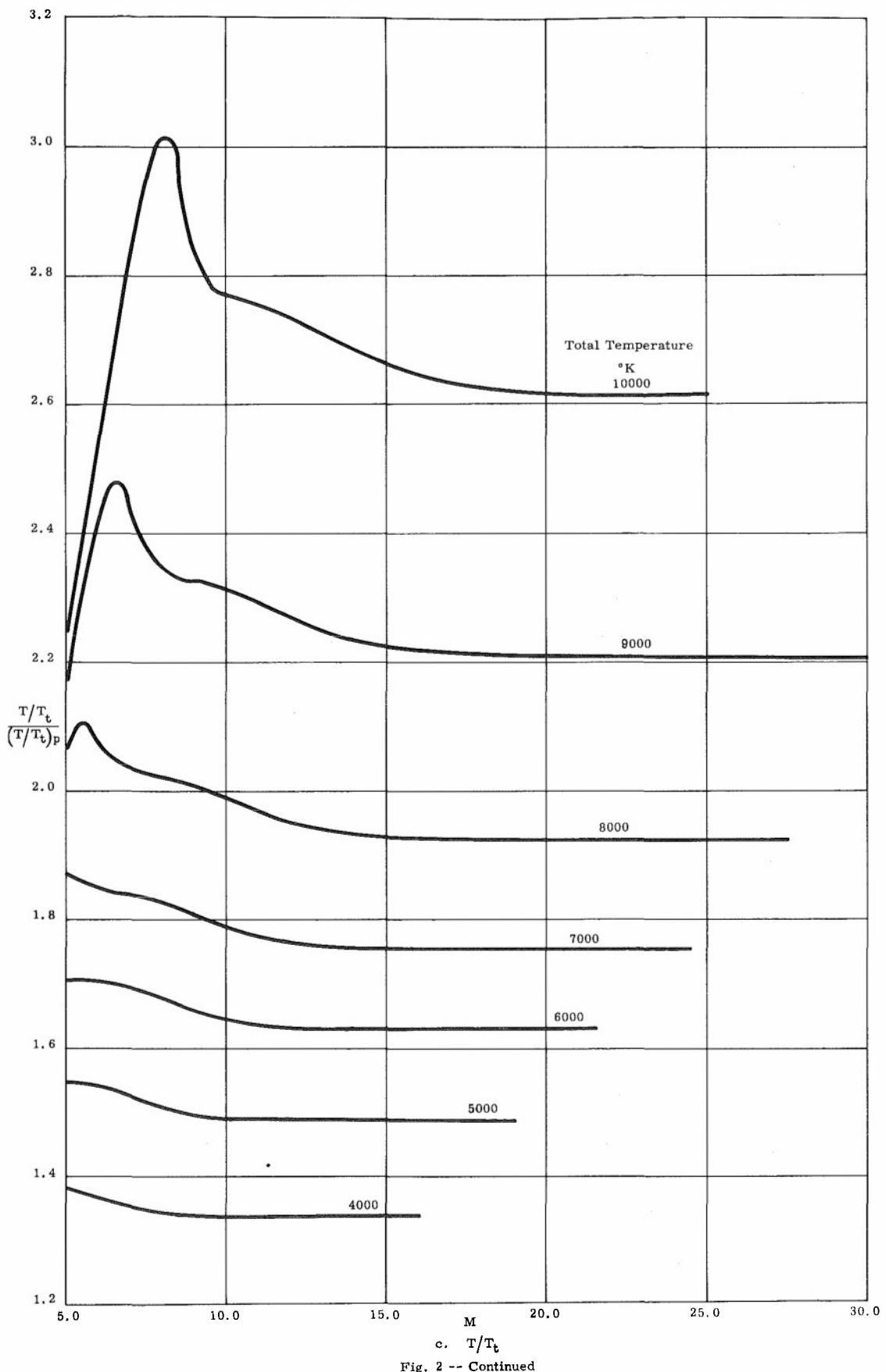


Fig. 2 -- Continued

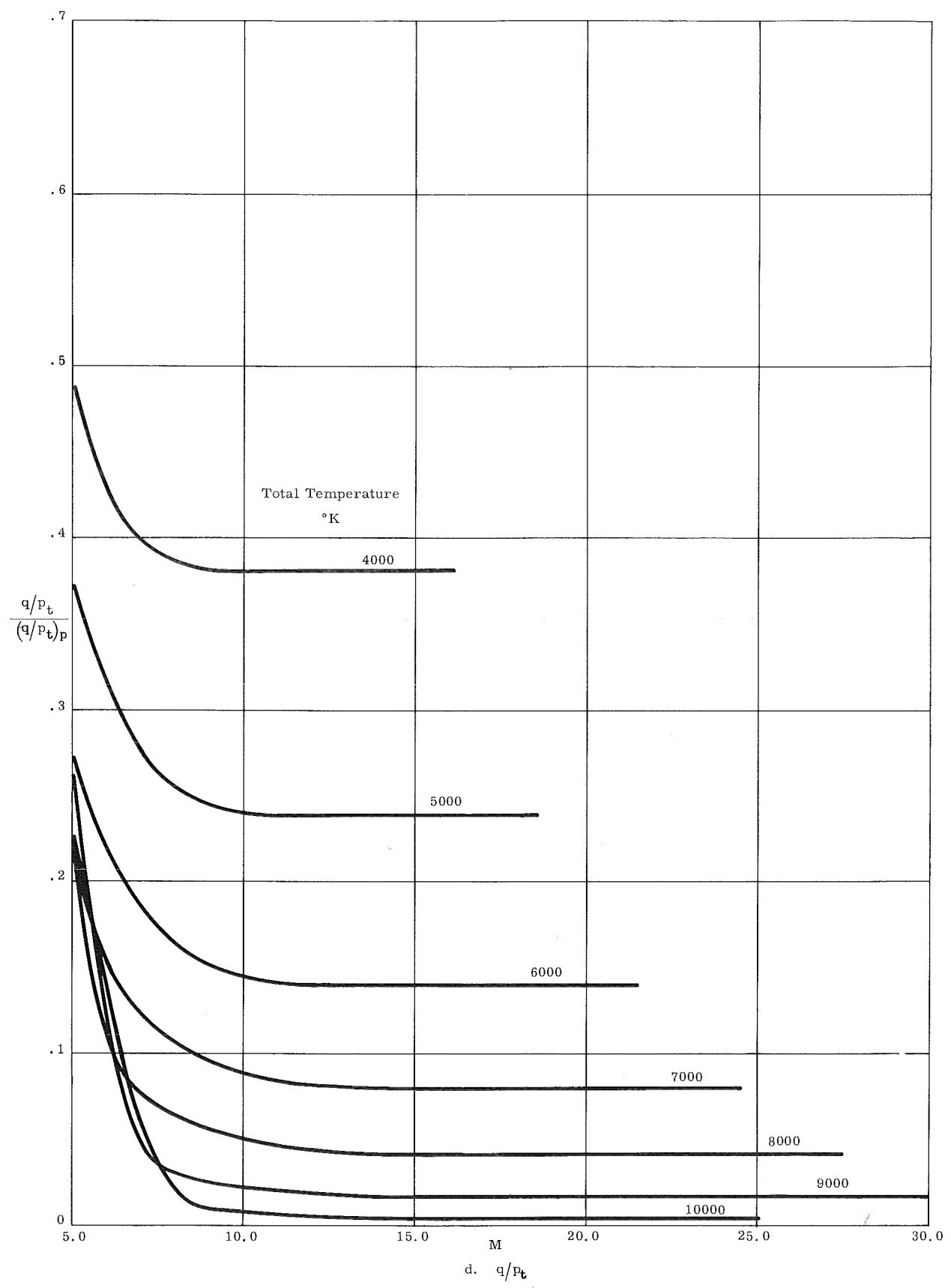


Fig. 2 -- Continued

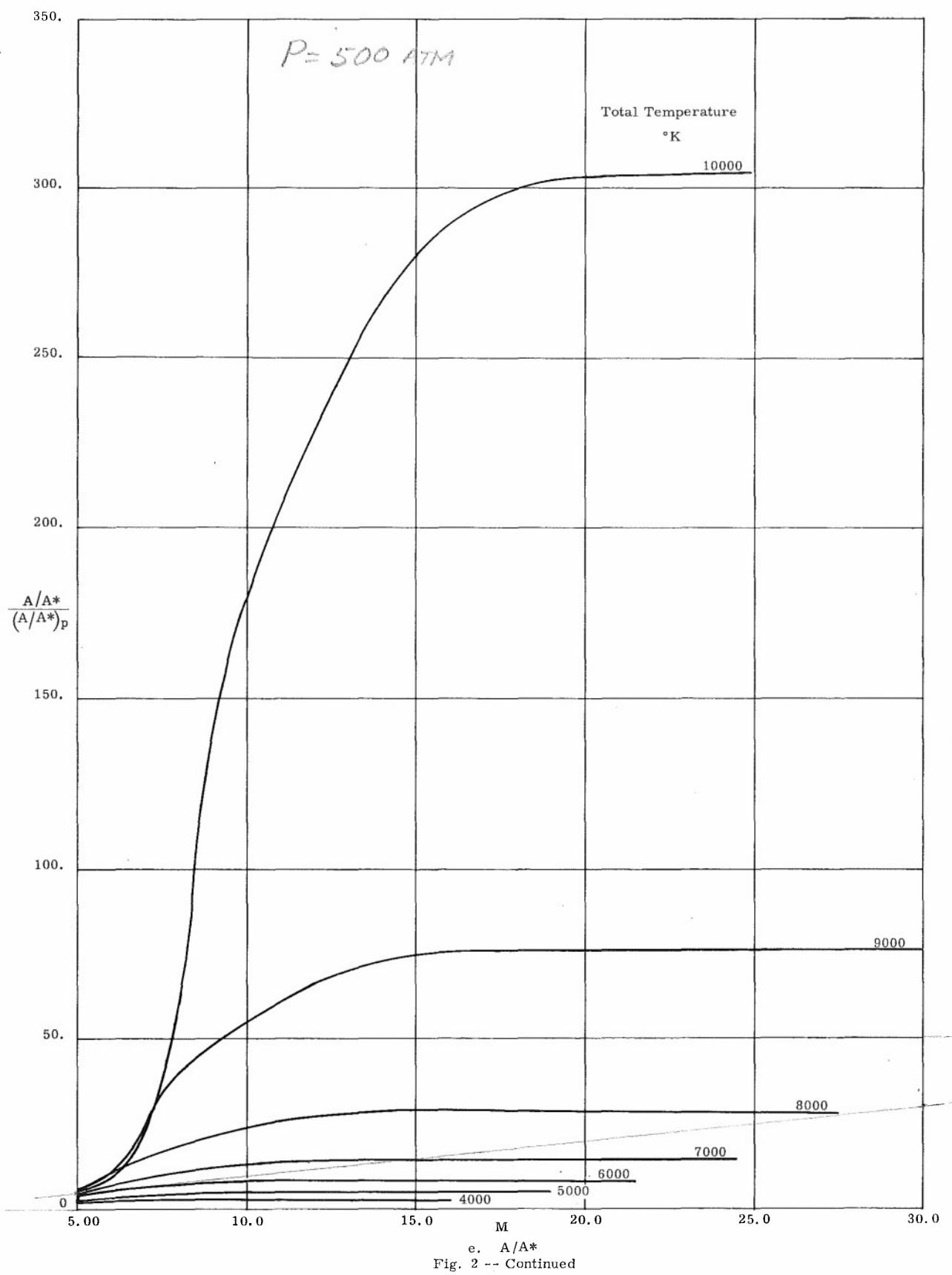


Fig. 2 -- Continued

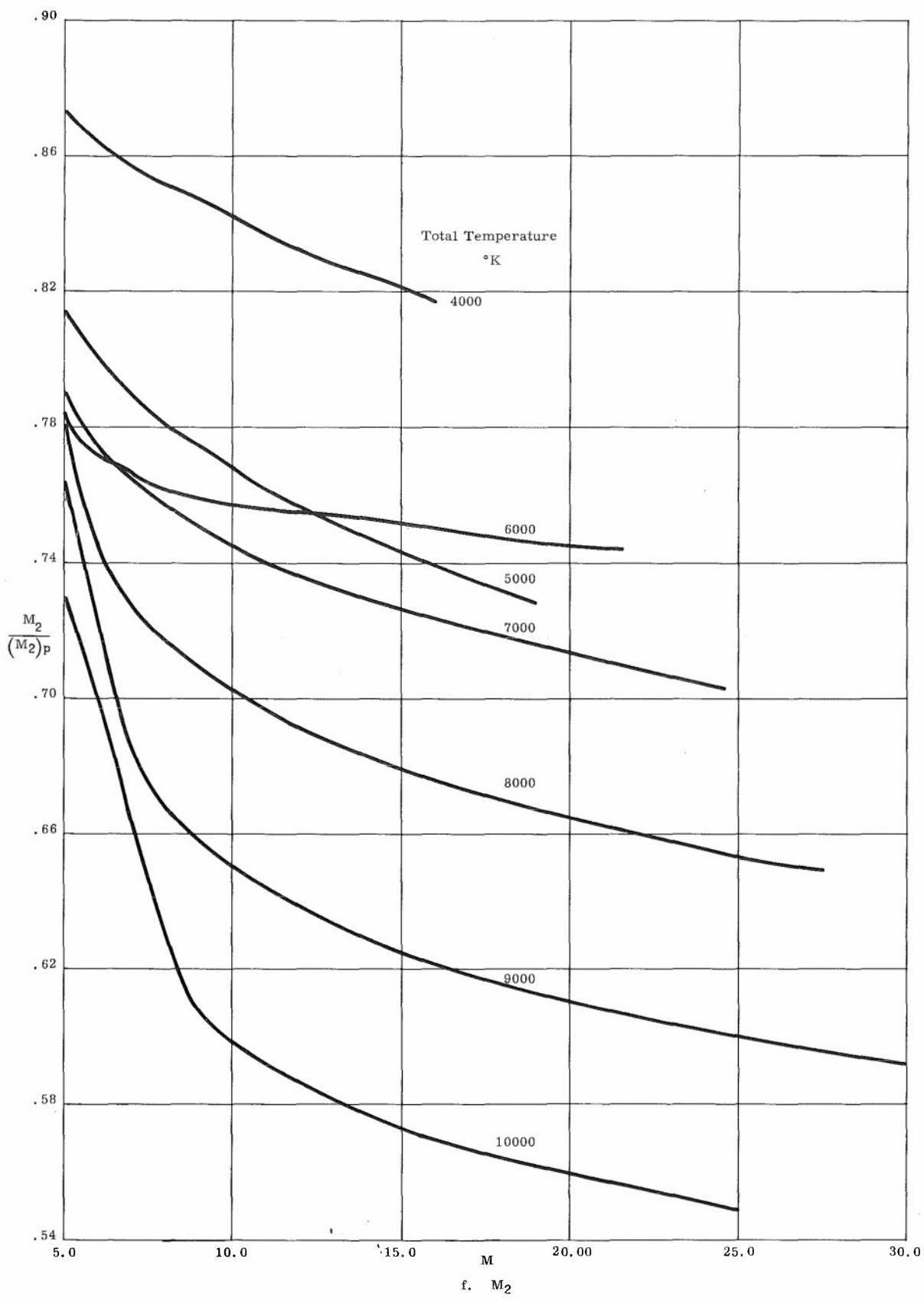


Fig. 2 -- Continued

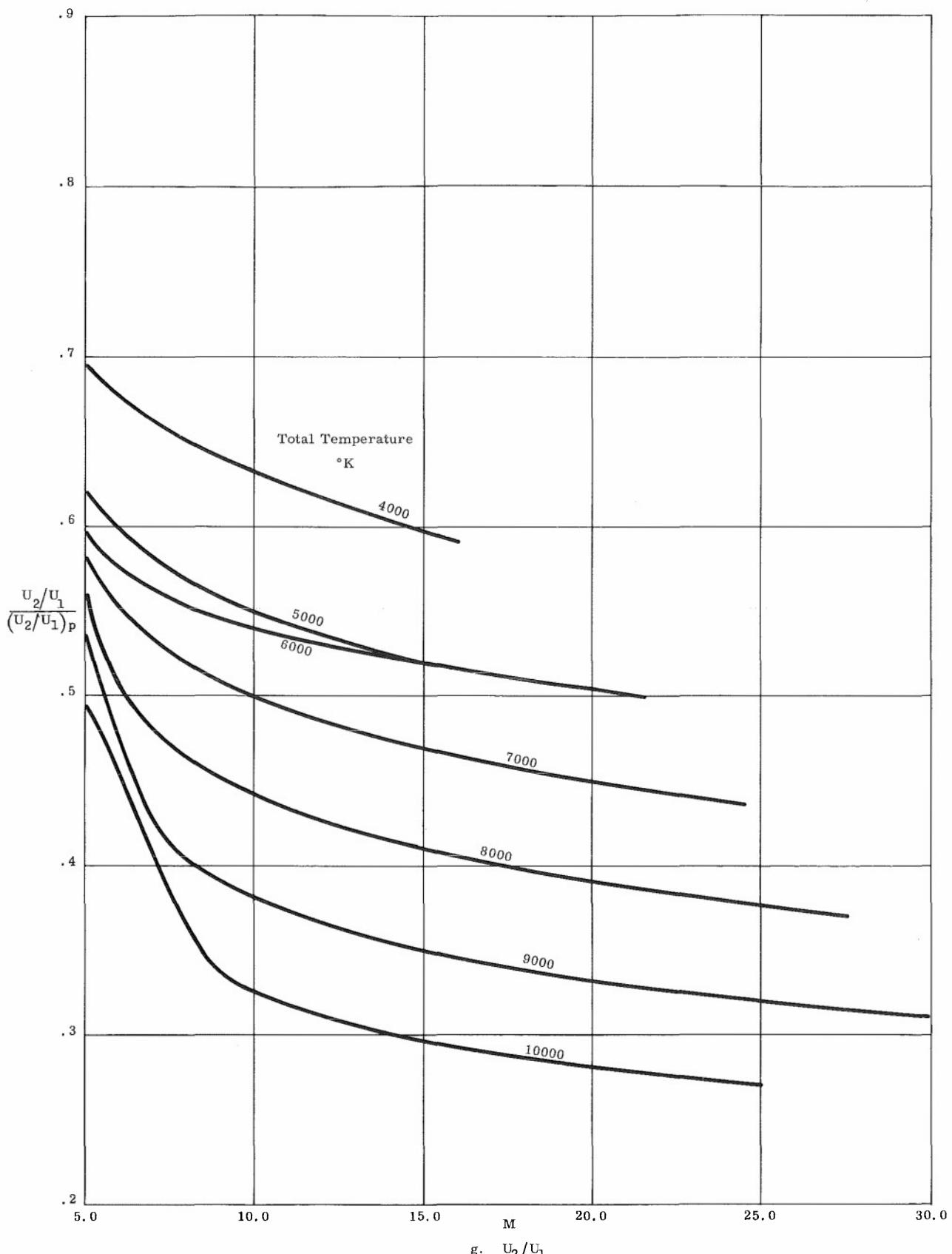
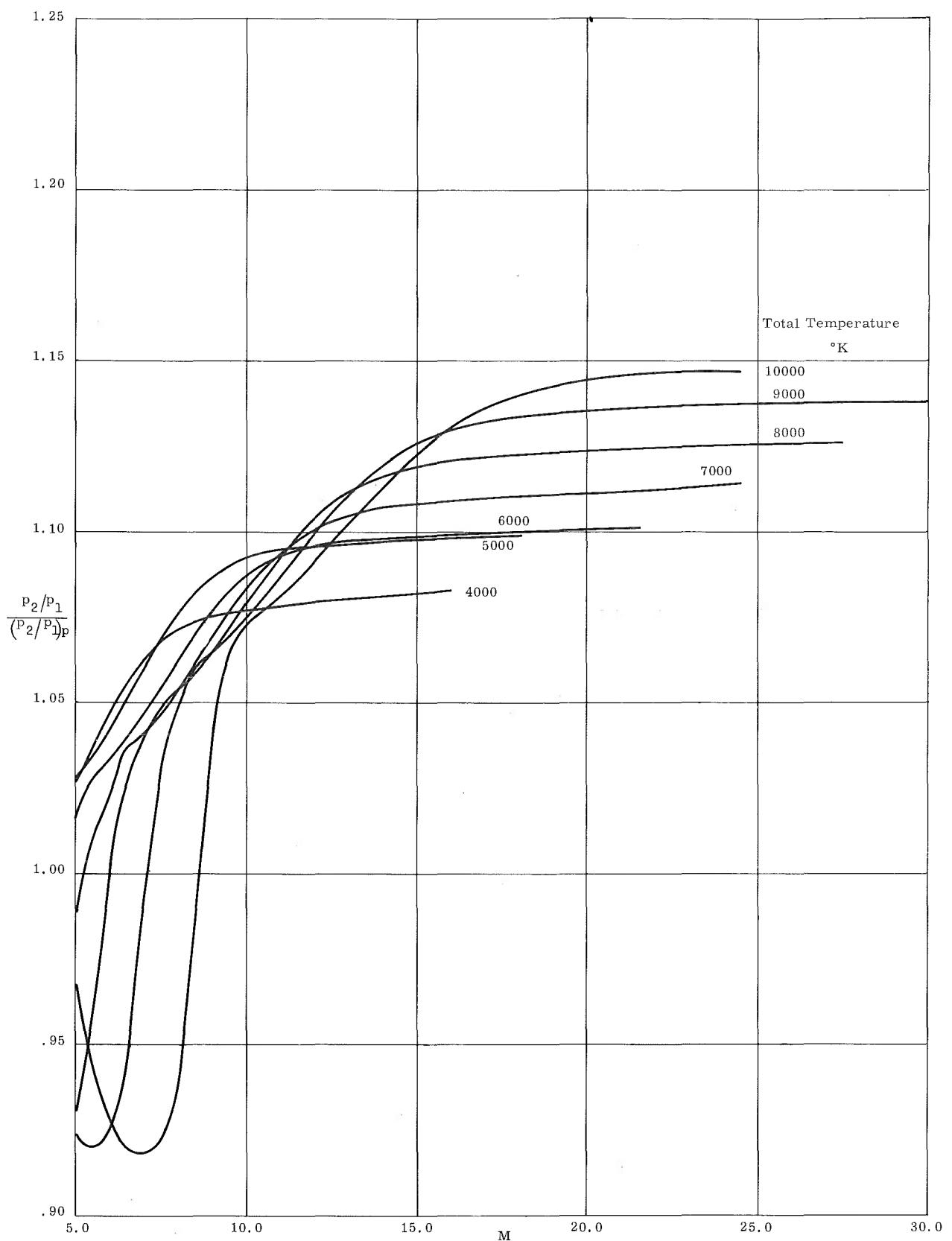
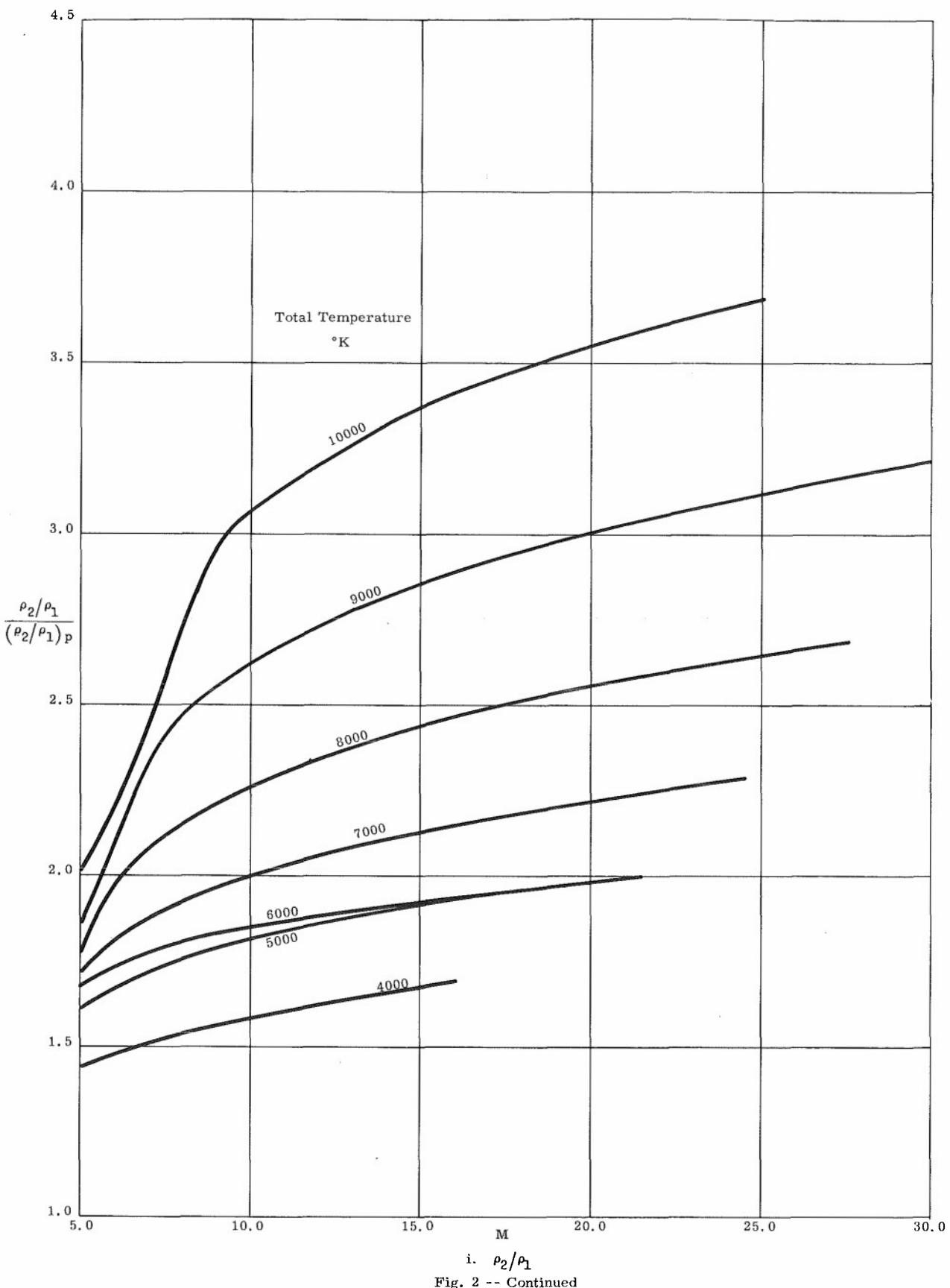


Fig. 2 -- Continued



h. $\frac{p_2}{p_1}$
Fig. 2 -- Continued



i. ρ_2/ρ_1

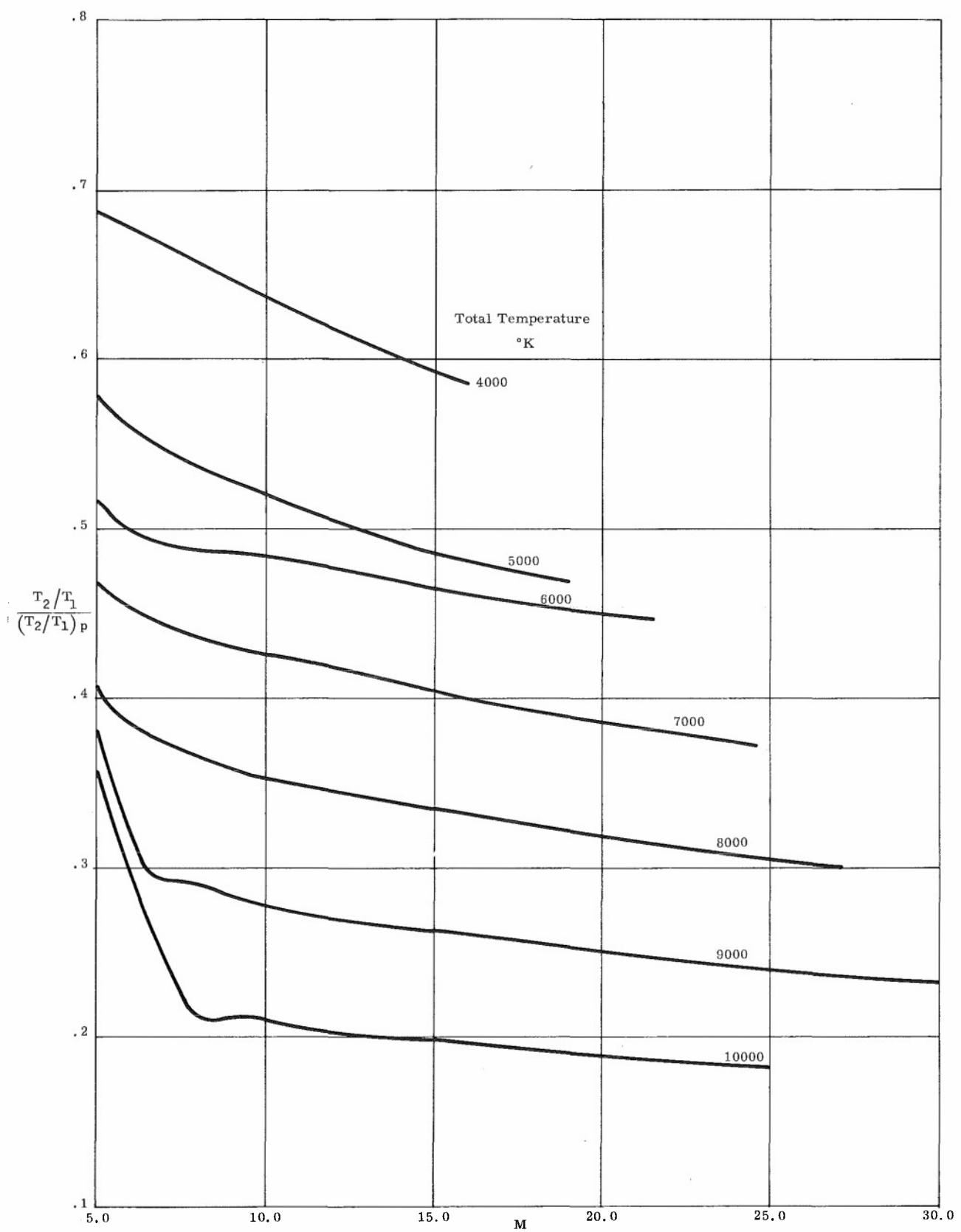


Fig. 2 -- Continued

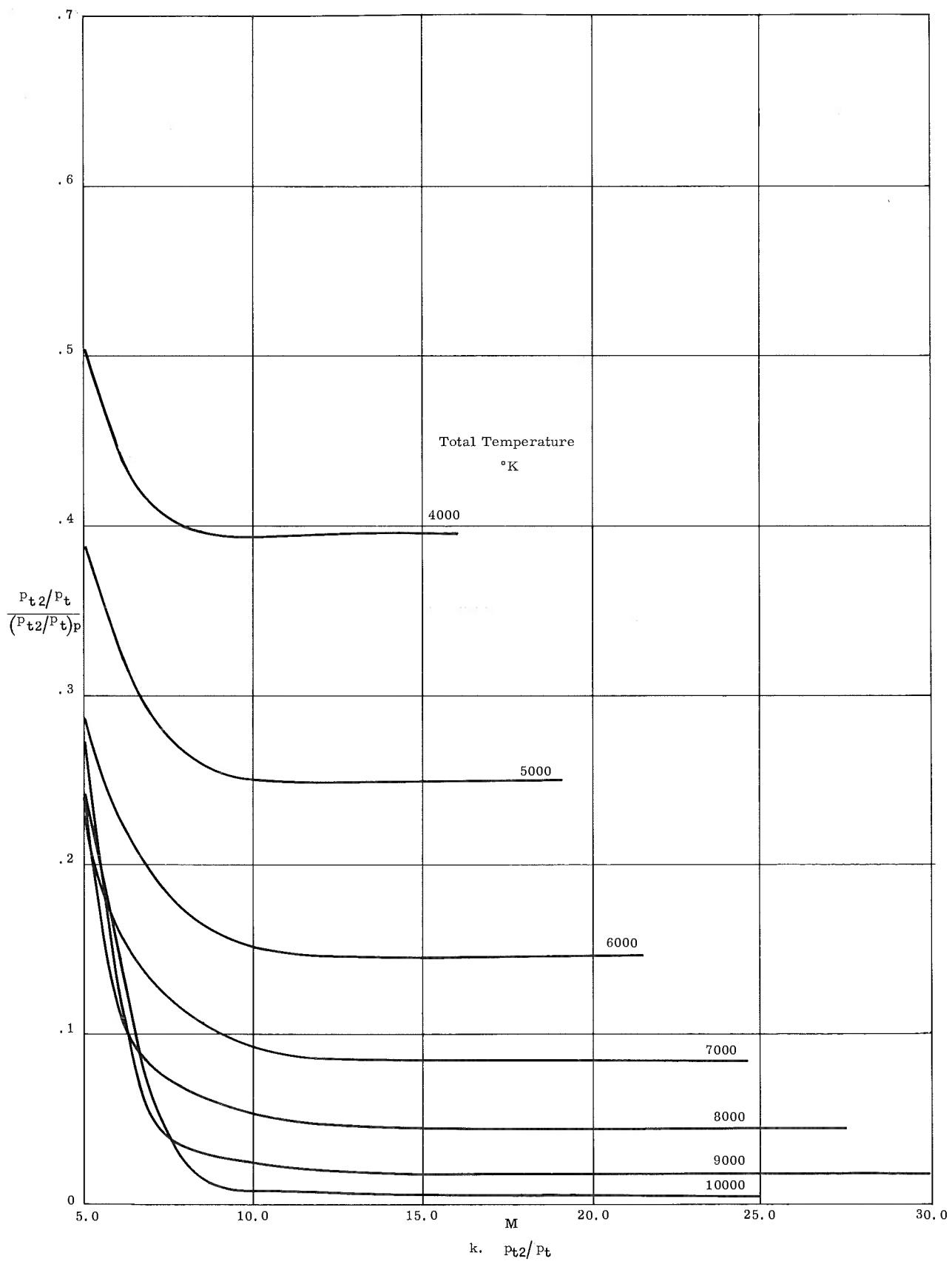


Fig. 2 -- Continued

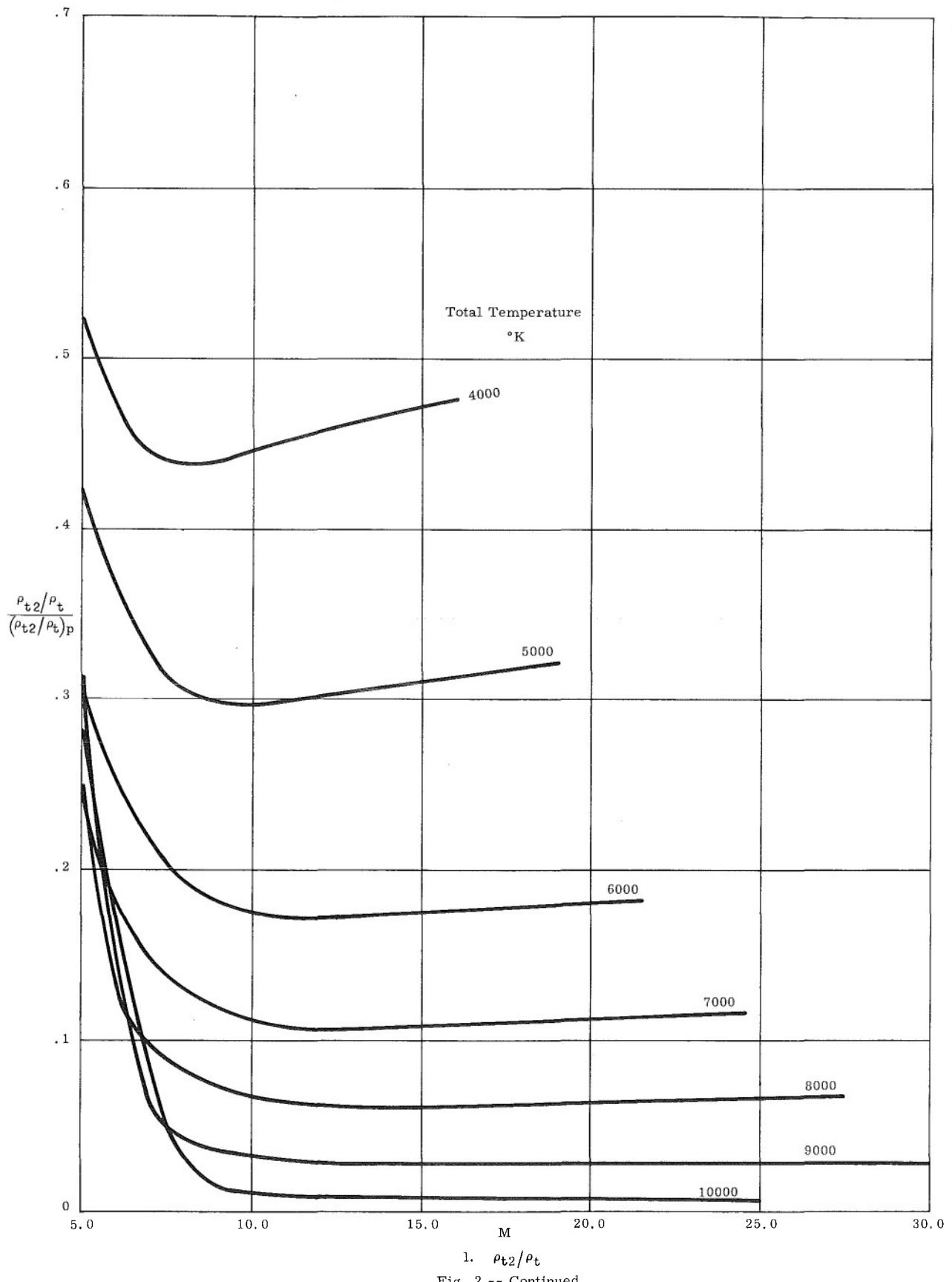
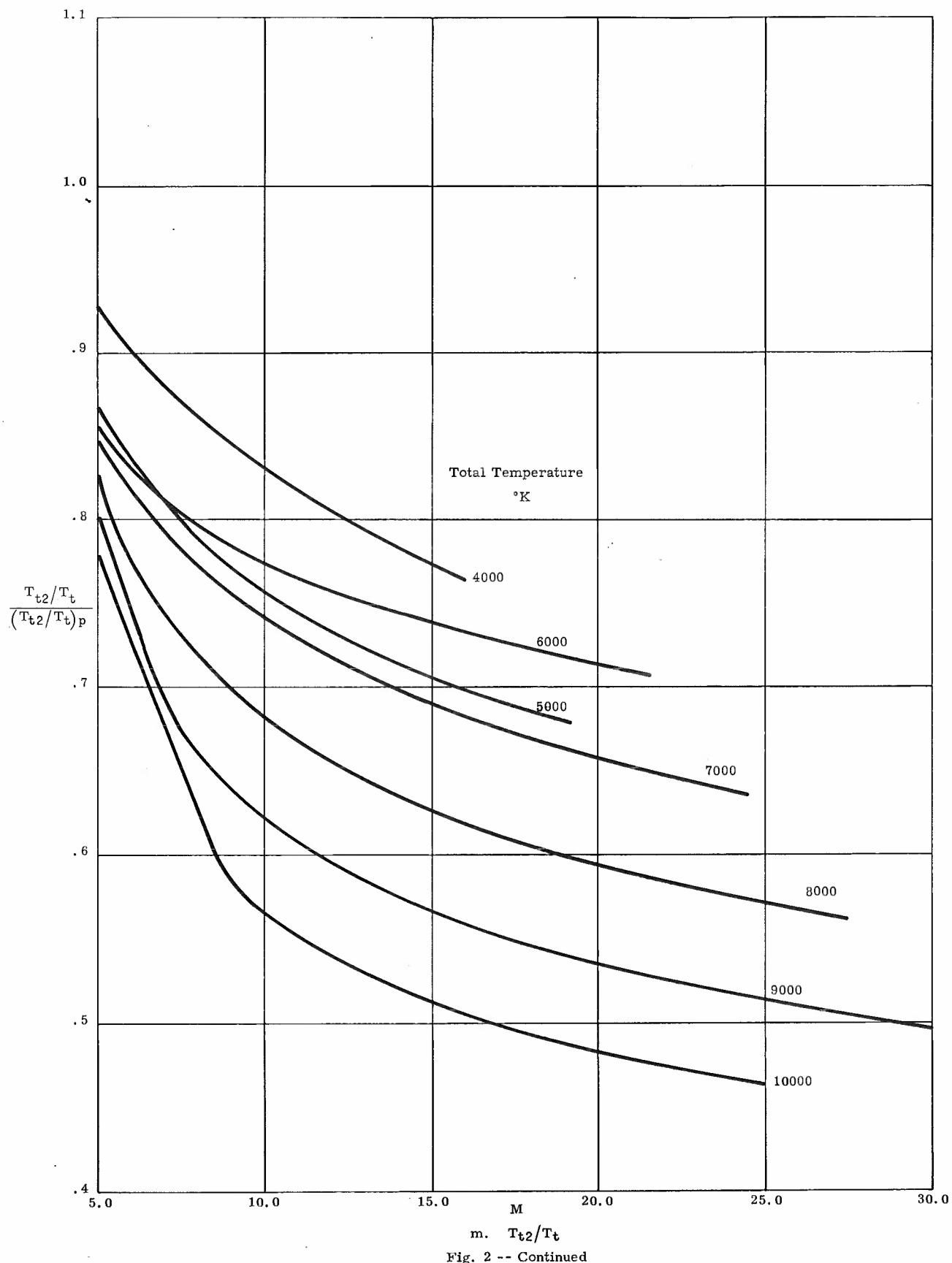
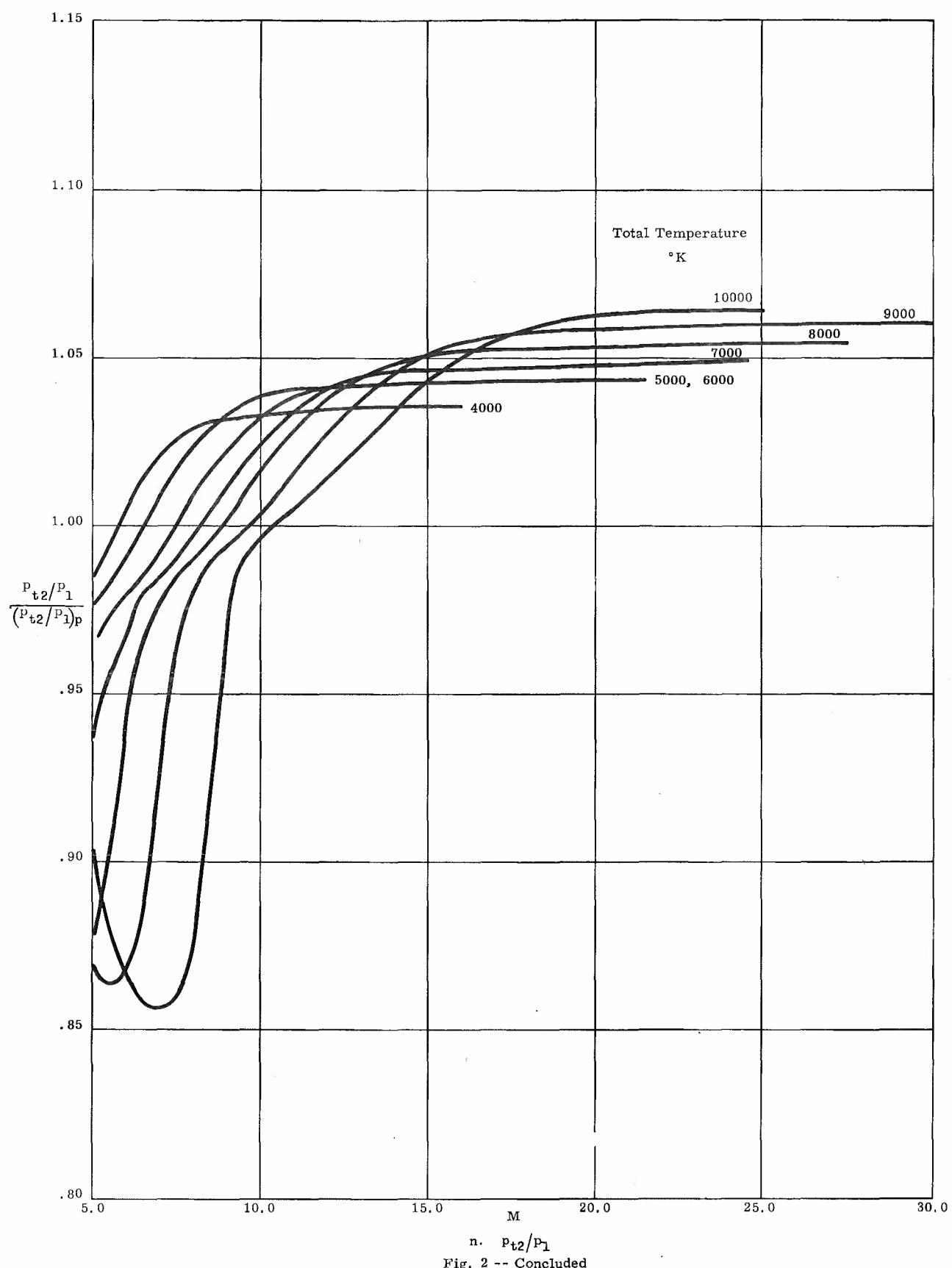


Fig. 2 -- Continued





n. $\frac{P_{t2}}{P_1} \cdot \left(\frac{P_{t2}}{P_1}\right)_p$
Fig. 2 -- Concluded

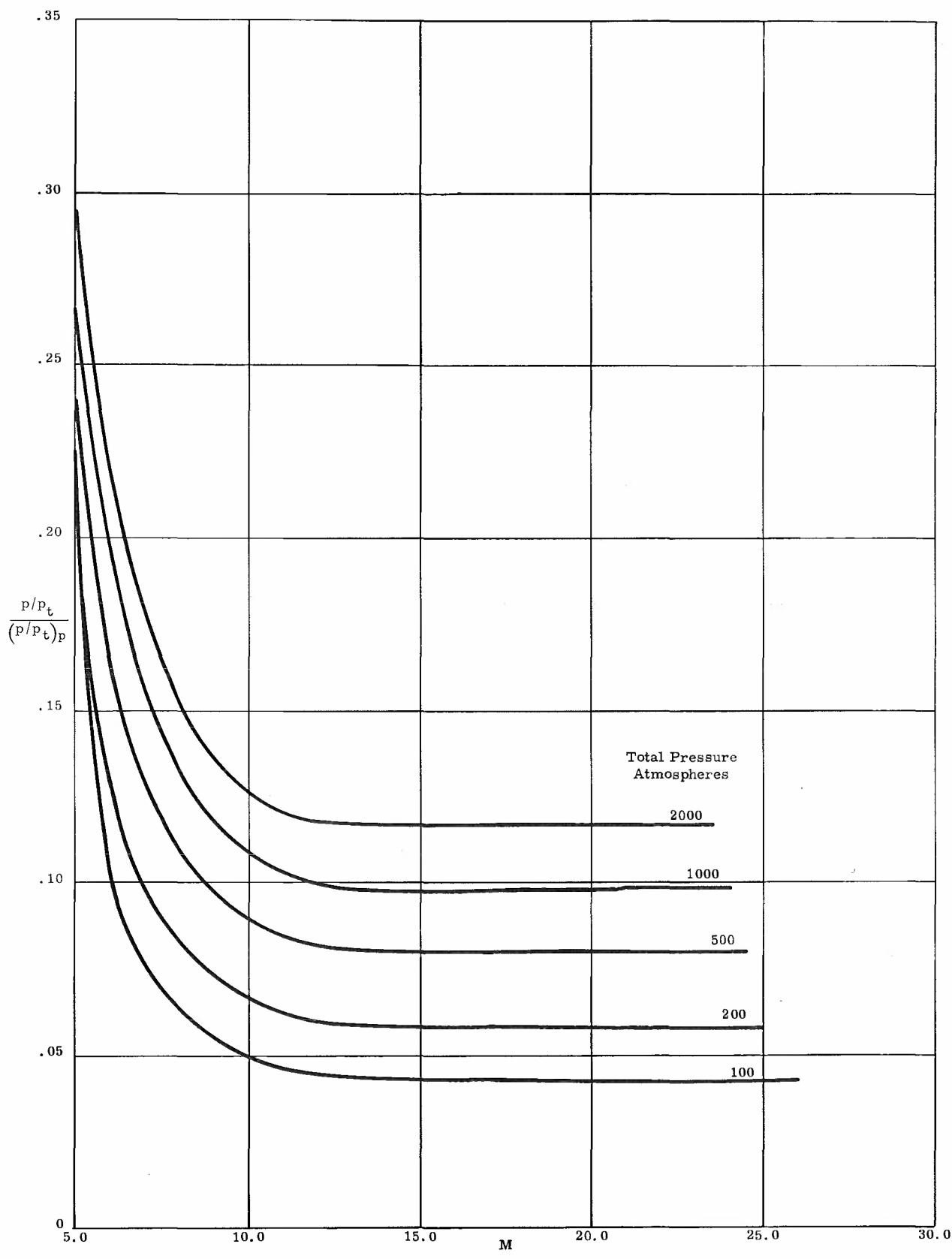


Fig. 3 -- Illustrative variation of ratios of real to perfect gas flow parameters with Mach number and total pressure at a total temperature of 7000°K

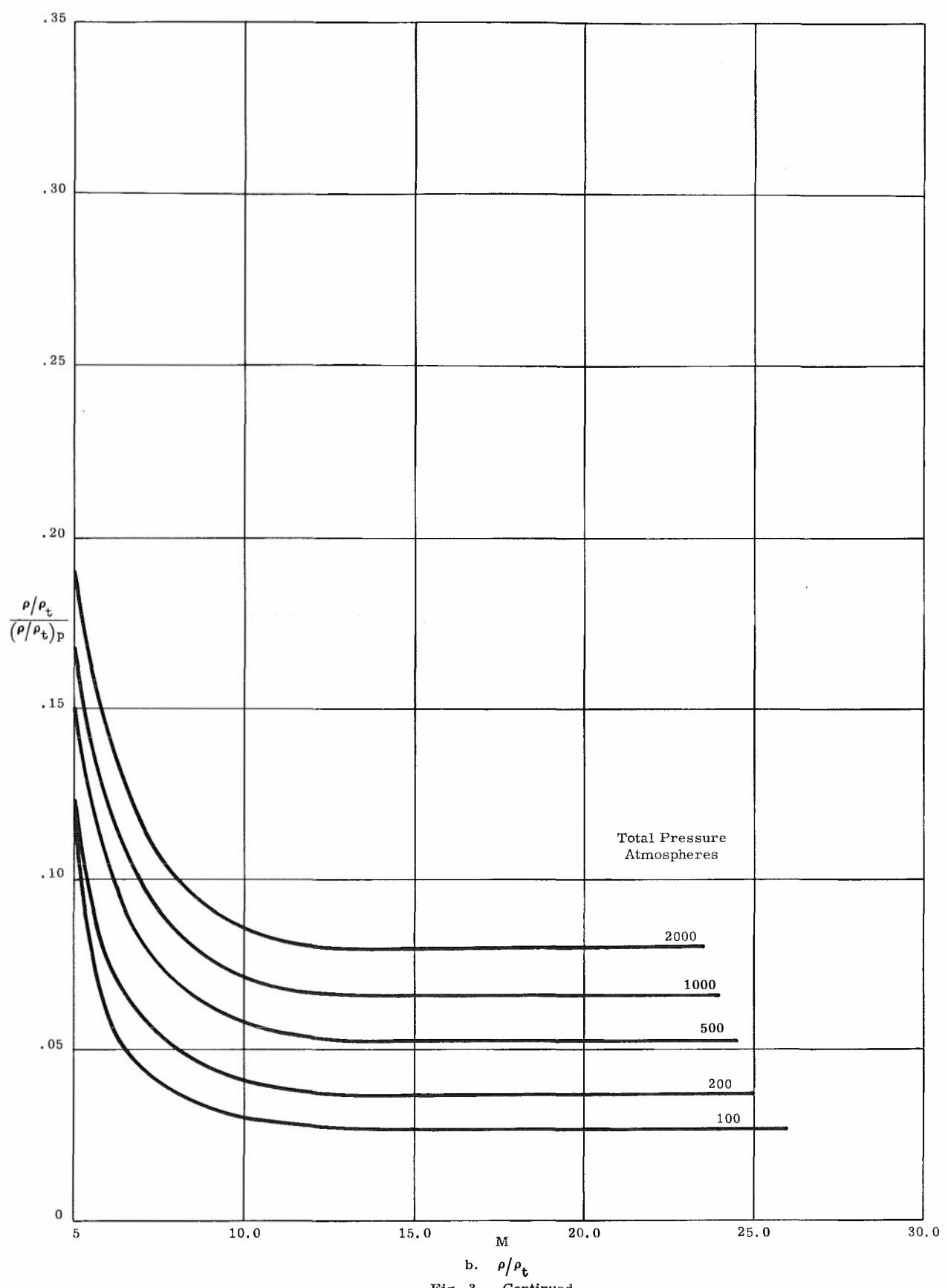
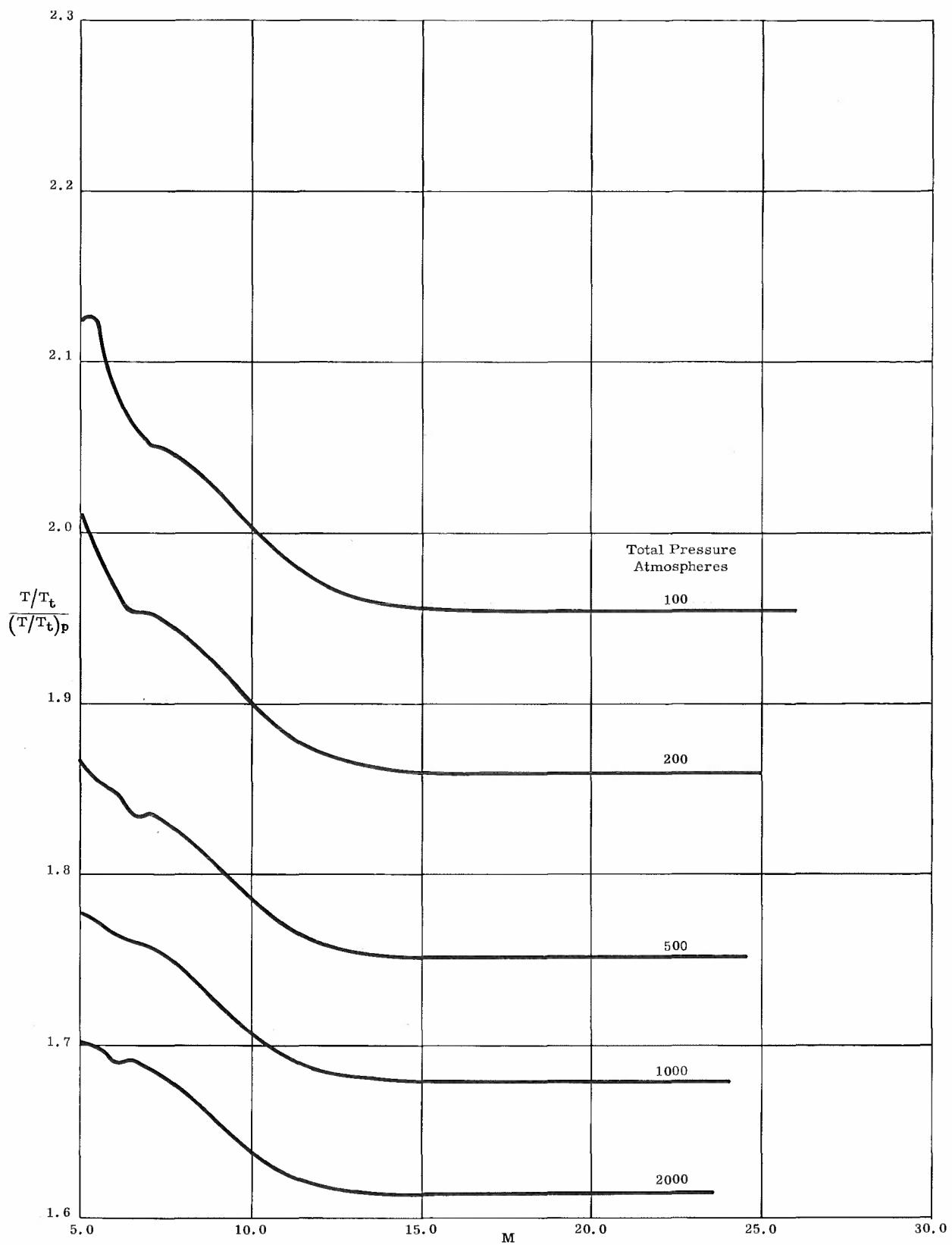


Fig. 3 -- Continued



c. T/T_t
Fig. 3 -- Continued

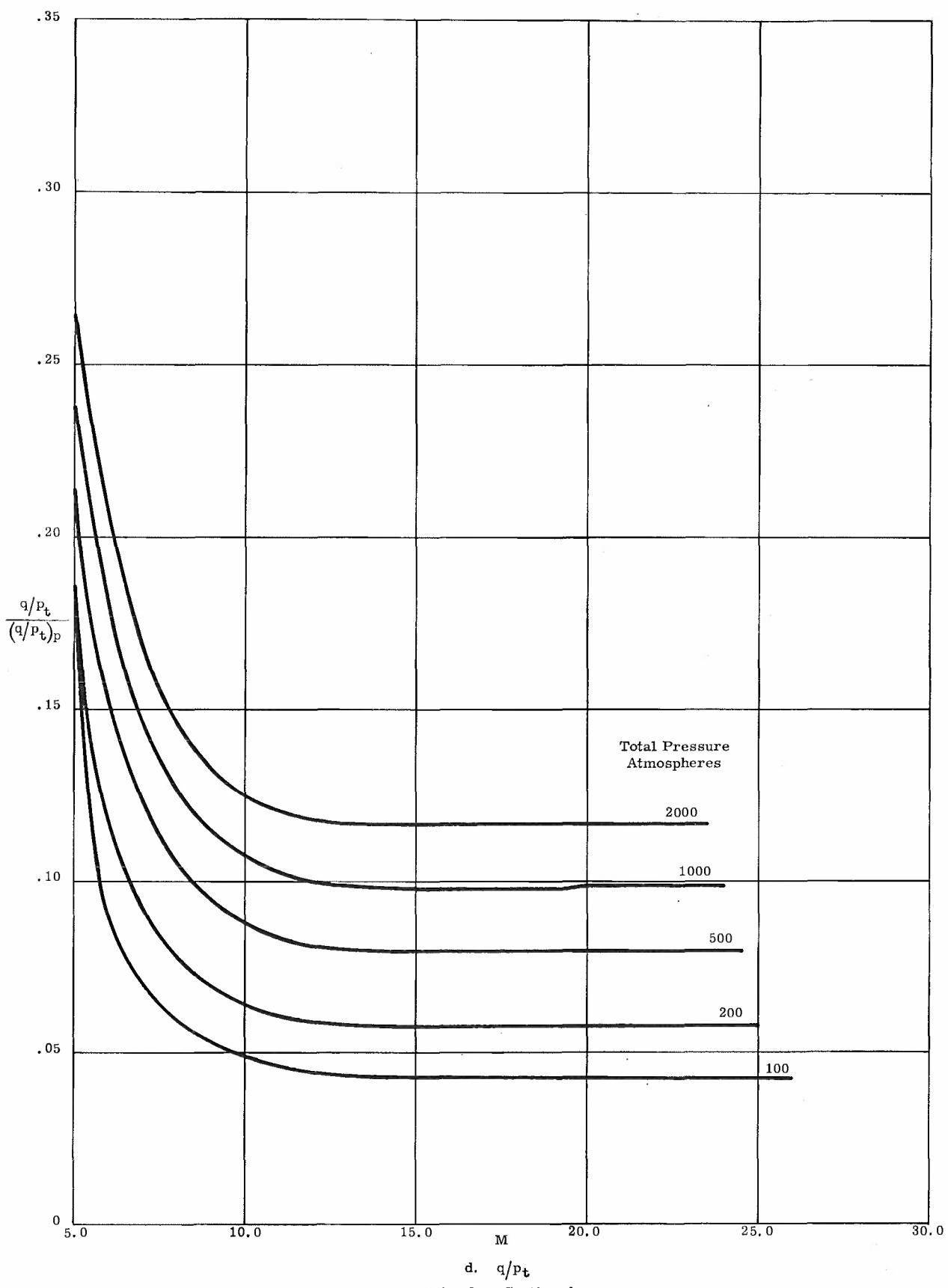


Fig. 3 -- Continued

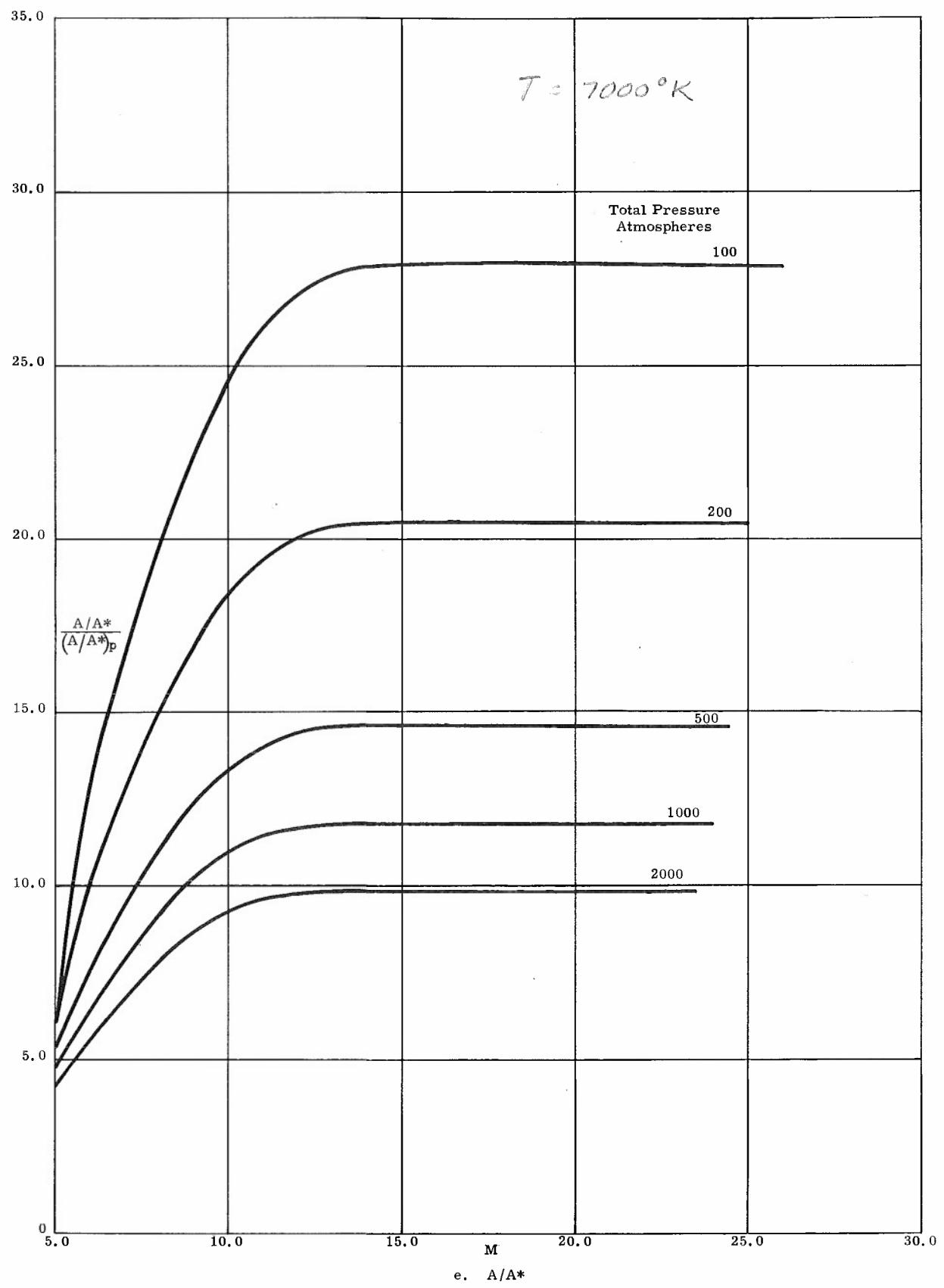


Fig. 3 -- Continued

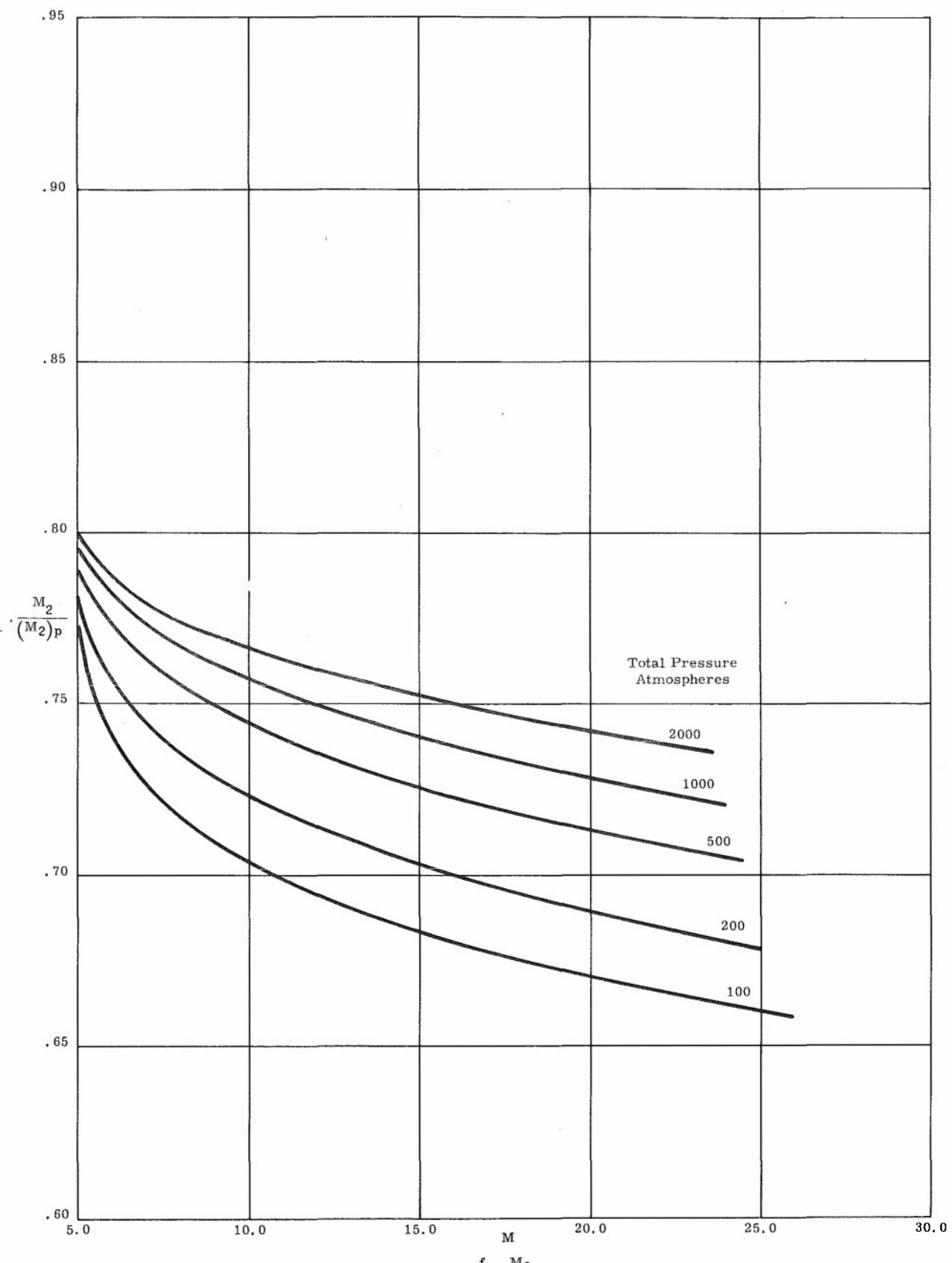
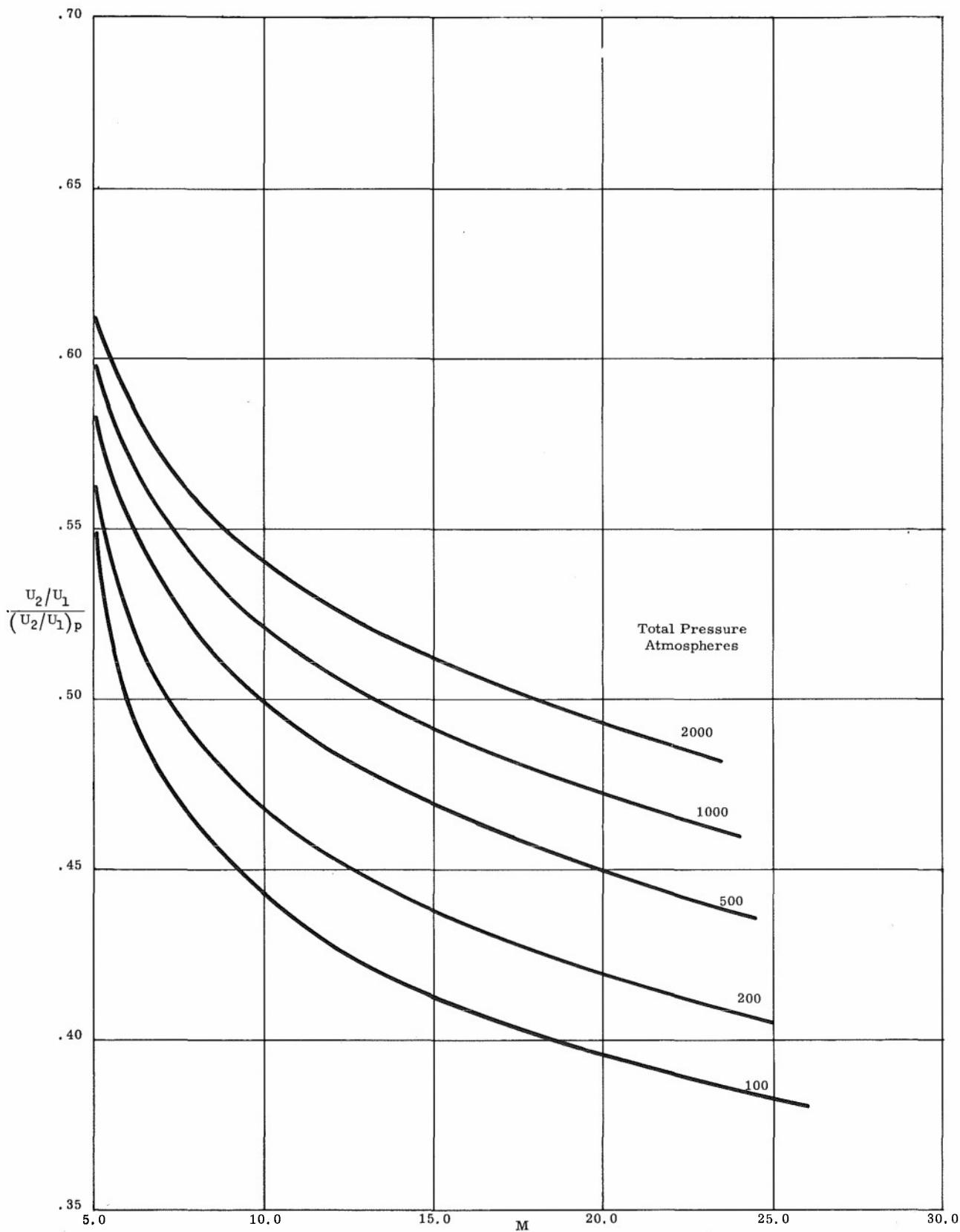


Fig. 3 -- Continued



g. U_2/U_1
Fig. 3 -- Continued

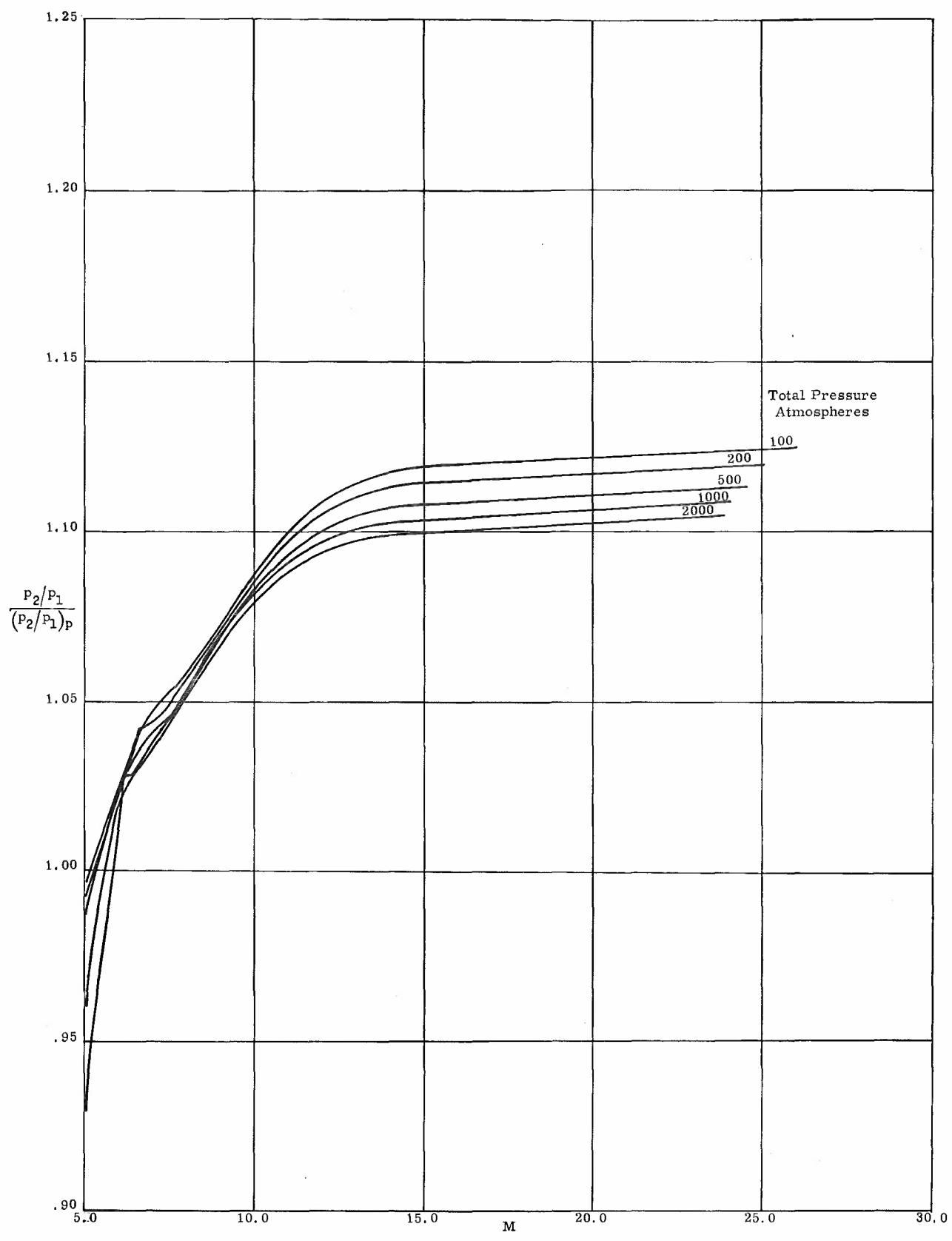


Fig. 3 -- Continued

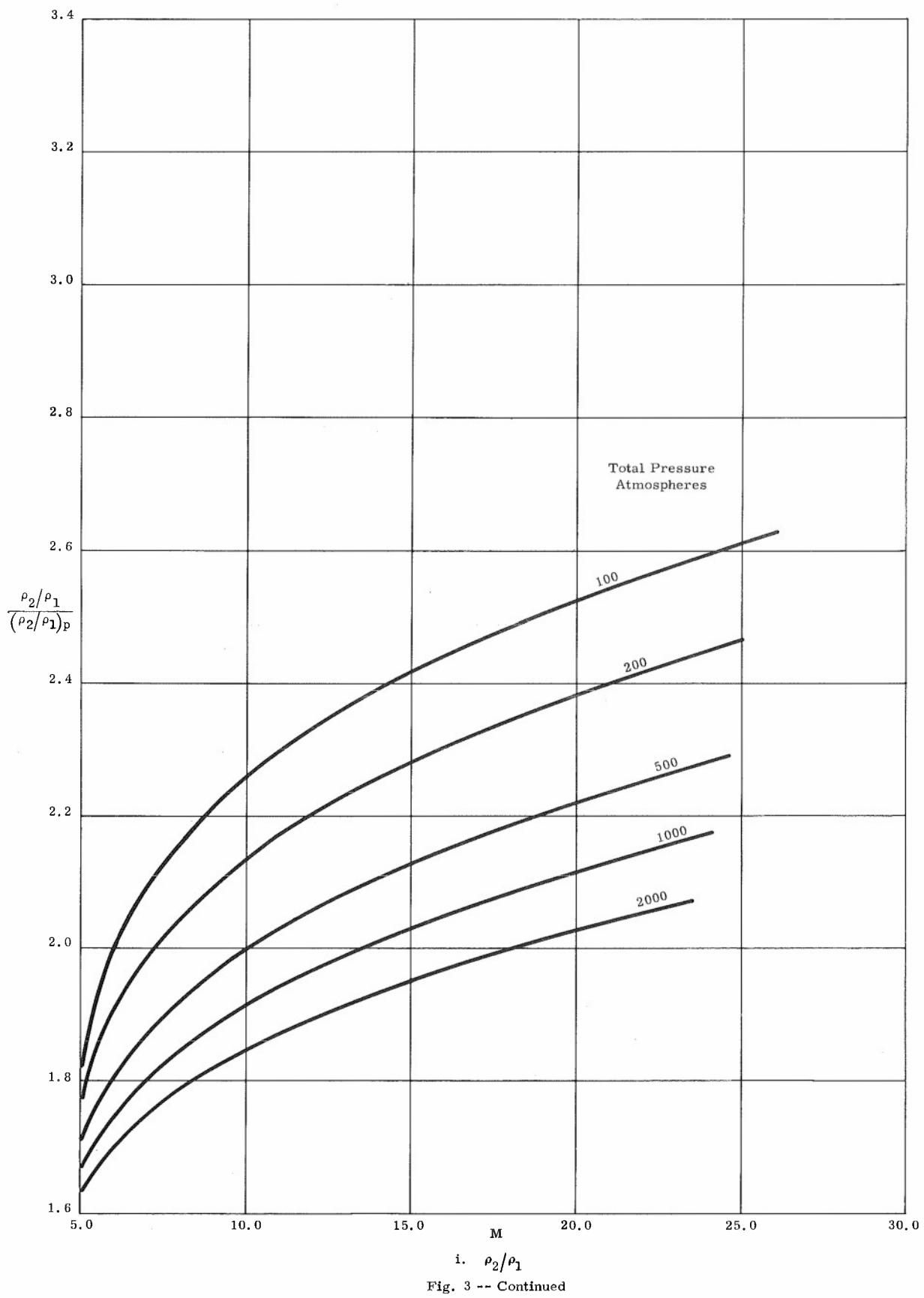
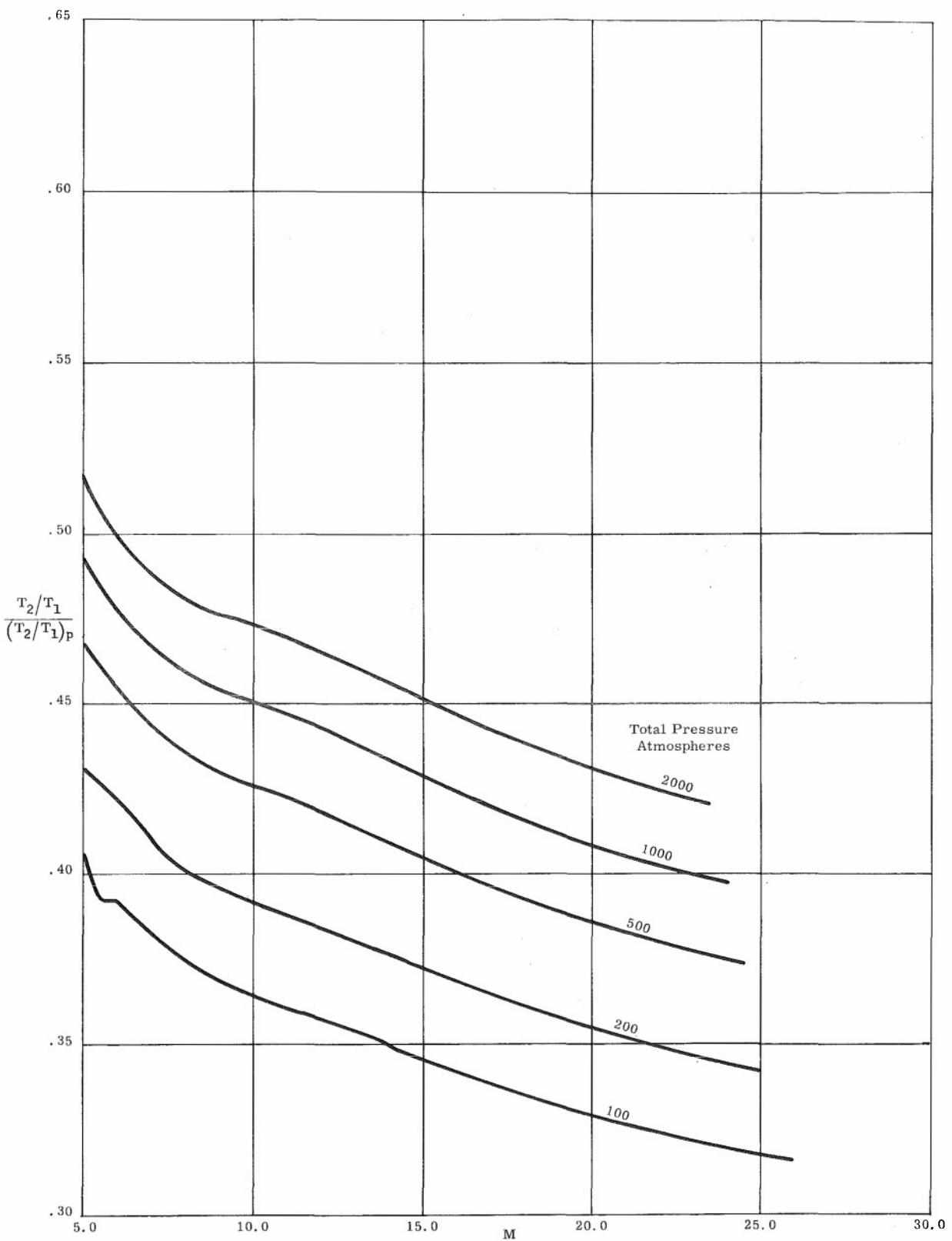
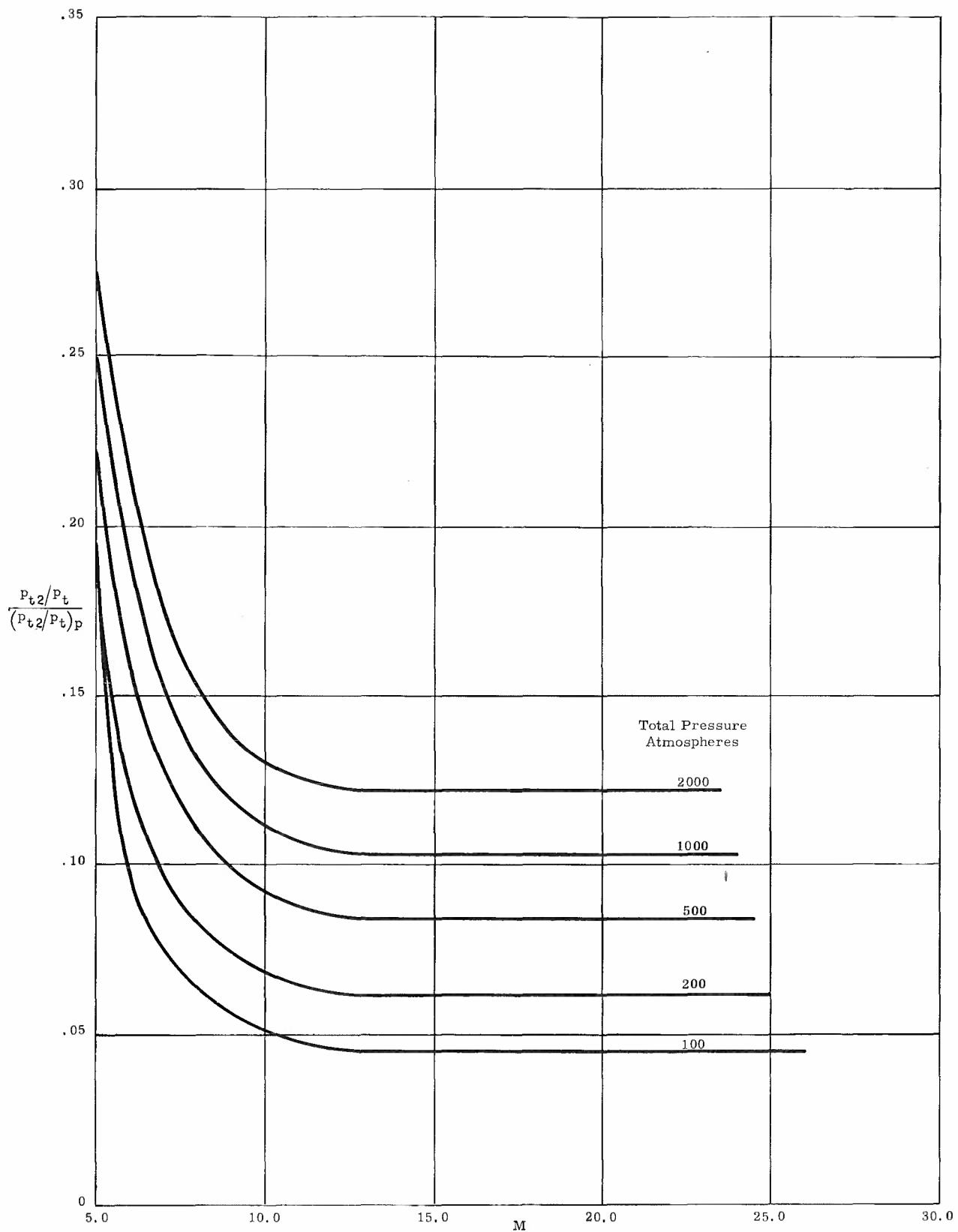


Fig. 3 -- Continued



j. T_2/T_1
Fig. 3 -- Continued



k. p_{t2}/p_t
Fig. 3 -- Continued

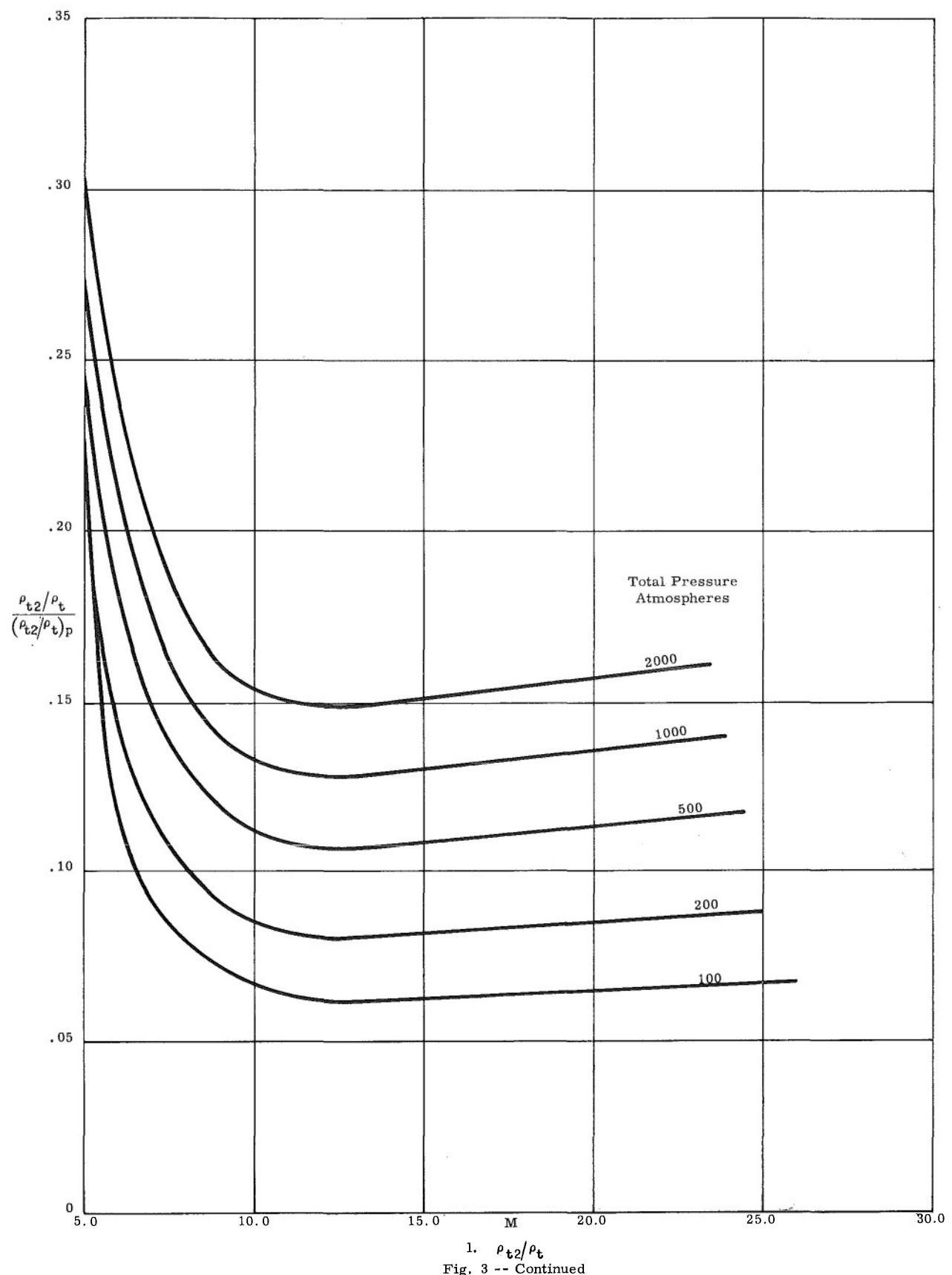


Fig. 3 -- Continued

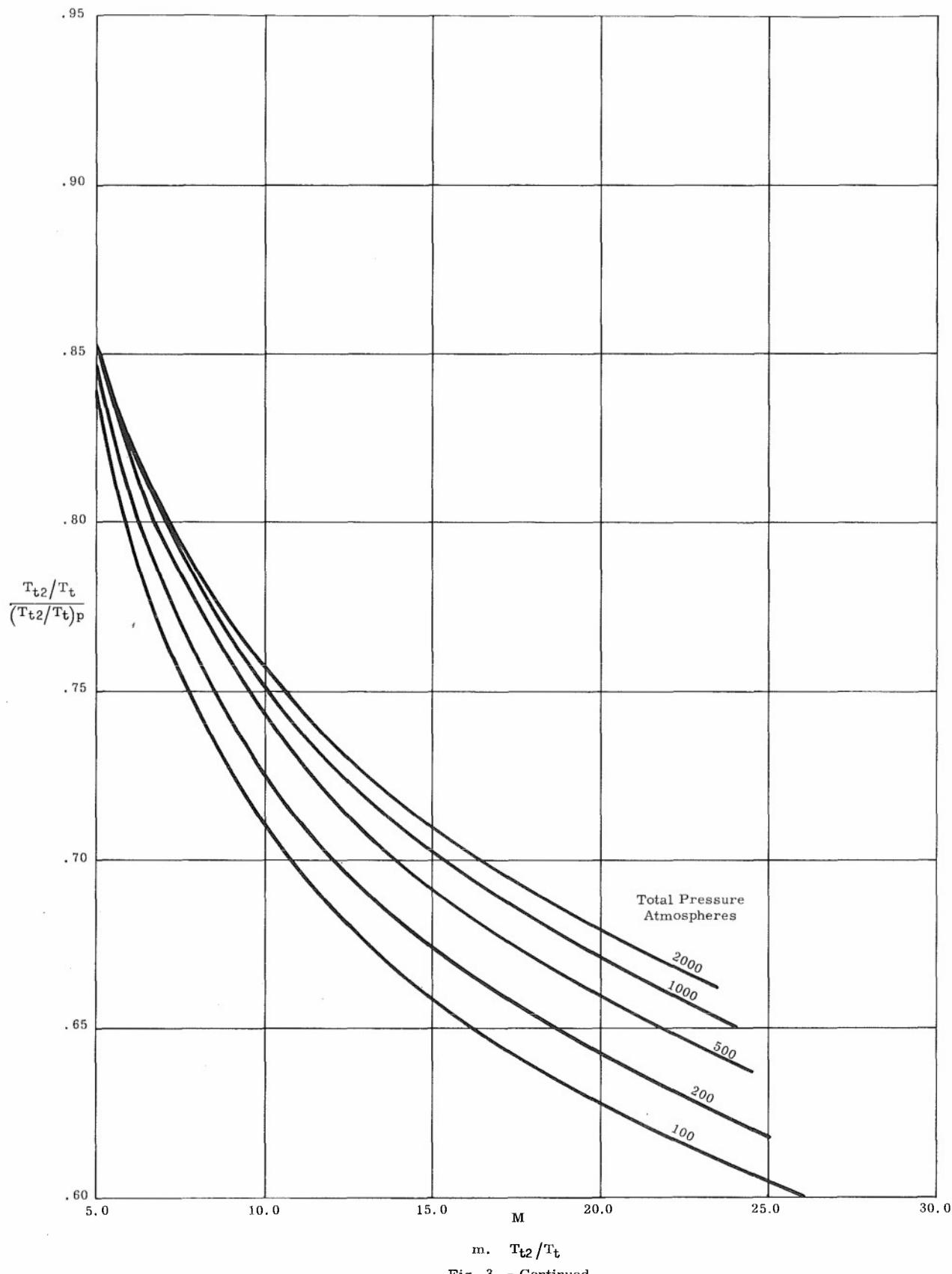
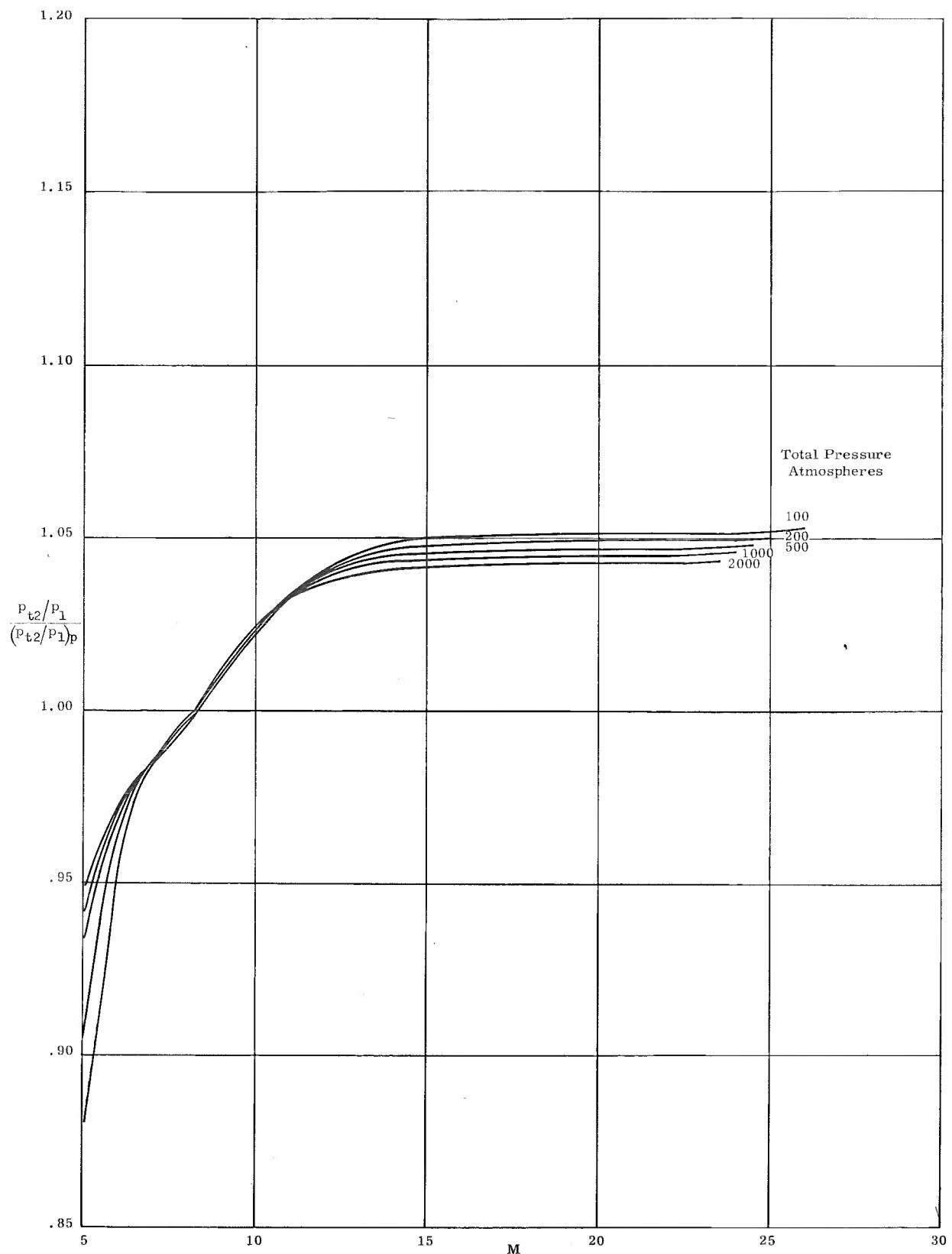


Fig. 3 -- Continued



n. $\frac{p_{t2}/p_1}{(p_{t2}/p_1)_p}$
 Fig. 3 -- Concluded

N O T E S